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Marriage and Physical Health:

Selection, Causal and Conditional Effects on Weight Gain and Obesity

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Marriage and Physical Health:

Selection, Causal and Conditional Effects on Weight Gain and Obesity

by

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Dedicated in loving memory

to

Diamond and Jasmine

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Marriage and Physical Health:

Selection, Causal and Conditional Effects on Weight Gain and Obesity

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Despite being linked to many health benefits, marriage is known to be related to weight gain and obesity (e.g. Hedblad et al., 2002; Lipowicz, Gronkiewicz, & Malina, 2002). Those who have studied physical health outcomes of marriage have taken three different approaches: 1) analysing selection effects, 2) investigating protection effects, and 3) focusing less on the discrete comparison of marrieds versus others and more on factors that might make marriage more or less beneficial, such as the quality of the interaction. The focus of this research is to examine this last approach. Could the quality of one's marriage, level of barriers to leaving, sex, and age provide insight into the relationship between marriage and weight gain? Data is from the Americans Changing Lives survey Waves I-III. Stability paths, marital protection paths, relationship commitment paths and psychological stress paths are outlined. The moderating effects of barriers to leaving, sex and age are also discussed. Cross sectional analyses show that marital quality decreases depression while barriers to leaving increases depression with

an interaction effect at Wave III where high marital quality decreases depression when barriers are low; when barriers are high, marital quality has a stronger effect on depression. These effects are stronger for the young than the old and for females compared to males. Longitudinal analyses show that marital quality and barriers to leaving are positively related to depression over time. The same effects occur when examined by age (barriers however, are no longer significant) and depression is negatively related to weight gain (only at Wave II) for the old. Analyses by sex show that barriers moderate the effect of marital quality on depression over time for men but not women at Wave III. Once again marital quality increases depression for both sexes but depression decreases weight concurrently and increases weight over time for men. Overall, results show modest support for the links between marital quality and barriers to leaving on depression and little support for its effect on weight. Results should be interpreted with caution as suppressor effects may be occurring and model fit was poor in the longitudinal models.

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Introduction

The state of marriage is known to be generally good for one's health. Marriage has been linked to many health benefits such as decreased mortality, (Berkman & Syme, 1979; Breeze, Clarke, Shipley, Marmot, & Fletcher, 2006; Gottman, 1998; Macintyre, 1992) increased cardiovascular health (Glynn, Christenfeld, & Gerin, 1999; Kiecolt-Glaser & Newton, 2001), and increased endocrine and immune system functioning (Gottman, 1998; Kiecolt-Glaser, et al., 1988; Kiecolt-Glaser & Newton, 2001).

Despite this good news for the health of those who are married, it is also true that marriage is known to be related to weight gain and obesity (Hedblad et al., 2002; Kahn & Williamson, 1990; Kahn, Williamson, & Stevens, 1991; Lipowicz, Gronkiewicz, & Malina, 2002; Meltzer & Everhart, 1995, 1996; Shafer, 2010; Sobal, Rauschenback, & Frongillo, 1992). Obesity places an unprecedented burden on health (Must et al., 1999) and has been linked to increased risk of cardiovascular disease (Yan et al., 2006), cancer (Batty et al., 2005), and diabetes (Hoefle, et al., 2005; Tanne, Medalie, & Goldbourt, 2005). Obesity has also been linked to a host of social problems such as decreased career aspirations, decreased satisfaction with career, family and other relationships, increased marital problems, and increased poverty among women in particular (Ball, Crawford, & Kenardy, 2004; Gortmaker, Must, Perrin, Sobol, & Dietz, 1993).

The goal of this research is to examine this paradox by first considering how marriage positively impacts health and then by examining how similar causal processes may be creating an increased probability of weight gain and obesity. In particular, I will draw upon literatures on the health benefits of marriage, the social facilitation of eating

and exercise and the impact of marital quality on health behaviors and outcomes to develop hypotheses to explain why marriage predicts weight gain. Although research on marriage and its effect on weight gain will be examined, the main focus of this research is to examine variations in the effect across marital quality subgroups.

Those who have examined physical health outcomes have taken three different approaches to the problem. The first explains the health benefits of marriage as due to selection and thereby spurious. This approach argues that healthier people are more likely to get married and as a result, later comparisons show that the married are healthier but not due to any causal process associated with marriage. The second approach sees marriage as having a positive causal effect by either: (1) encouraging positive health behaviors (e.g., regular checkups, diet, and exercise); (2) discouraging negative health behaviors (e.g., smoking, drinking, and risk taking); or (3) increasing access to and awareness and utilization of health care and other forms of support in times of need. Finally, a third approach focuses less on the discrete comparison of marrieds versus others and more on factors that might make marriage more or less beneficial, such as the quality of the interaction. The focus of this research is to examine this last approach.

Could the quality of one's marriage, level of barriers to leaving, sex, and age provide insight into the relationship between marriage and weight gain/obesity? If so, how are these effects produced and what is the link between marital quality effects and theories of weight change and obesity? This study will examine these questions. I will first review research findings on the relationship between marriage, health, and weight gain/obesity. I will then review existing theories of weight gain/obesity that may help

explain how marriage has this effect. Third, I will more fully discuss the effects of marital quality on health and consider how similar processes may produce higher rates of weight gain and obesity for some married individuals. Finally, I will develop a theoretical model that may explain the effects of marital quality on weight gain and obesity.

CHAPTER ONE: LITERATURE REVIEW

Marriage, Health, and Weight Gain/Obesity

Research has identified both physical and mental health benefits associated with marriage. It is important to recognize that health is generally defined as a state of physical and mental well-being, not simply the absence of disease (World Health Organization, 2005). Physical well-being is described by Ross, Mirowsky and Goldsteen (1990) as feeling fit and able, unrestricted by disability or discomfort. Emotional well-being is described as feeling happy, hopeful and energetic. Physical and mental health are highly correlated (Mechanic & Hansell, 1987; Verbrugge, 1983) and both are related to marriage (for review see Ross et al., 1990).

The married have lower rates of mortality and morbidity than those who divorce or never marry (Berkman & Syme, 1979; Breeze et al., 2006; Carter & Glick, 1976; Koskenvuo, Kaprio, Lonnqvist, & Sarna, 1986; Lillard & Waite, 1995). And this relationship is stronger for men than for women (Berkman & Syme, 1979; Carter & Glick, 1976; Gove, 1972; House et al., 1992; Stroebe & Stroebe, 1983; Williams & Umberson, 2004). The married have better cardiovascular, endocrine and immune system functioning (Glynn et al., 1999; Gottman, 1998; Kiecolt-Glaser & Newton, 2001). Chronic disease and disability are also more prevalent among the unmarried (Alder, 1995) and rates are lower for those in long-term marriages compared to those of shorter duration (Pienta, Hayward, & Jenkins, 2000). Higher levels of well-being are found in individuals who get and stay married. Married men report less depression and married women less alcohol problems than their single counterparts (Horwitz, White, & Howell-

White, 1996). In spite of research showing health benefits of marriage, there is, however, a serious health repercussion of marriage: overweight and obesity.

Prevalence of Obesity

Body Mass Index (BMI) is one of the common methods used to determine weight status in a population. It is calculated as weight in kilograms divided by the square of height in meters (kg/m^2) (Bray, 1978). Despite evidence suggesting that BMI underestimates body fat in people who have lost muscle mass such as the elderly (Visscher & Seidell, 2001) and overestimates BMI for athletes with low body fat, it is generally considered a reliable measure of weight status at the population level. (See Kannel (1983) and the National Center for Health Statistics (1983) for a discussion of reliability of BMI). BMI categories are used to identify cut off points for overweight and obesity. These cut points are based on associated health risks. Cutoff points defined by the US Department of Agriculture (1995), World Health Organization (2006), and US Department of Health and Human Services (2005) are: 'underweight' defined as BMI < 18.5; 'normal weight' as BMI 18.5-24.9; 'overweight' as BMI 25-29.9; 'obese' as BMI ≥ 30; and extremely obese as ≥ 40.

Estimates from the National Health and Nutrition Examination Survey (NHANES) using standardized protocols and calibrated equipment to calculate Body Mass Index (BMI) reveal obesity levels (BMI > or = to 30 kg/m2) for adults 20 years old and older to have remained relatively stable at 30.5% in 1999-2000 compared with 32.2% in 2003-2004 (Ogden et al., 2006). Prevalence rates increased to 35.7% in 2009-2010 (Ogden, Carroll, Kit, & Flegal (2012). When including those individuals who are

overweight (BMI of 25.0- 29.9) with those who are obese, the rates for the US population are as high as 64.5% in 1999-2000 and 66.3% in 2003-2004 (Ogden et al., 2006). In this survey, older adults as well as Mexican American and Black women were more likely to be obese compared with, younger adults and non-Hispanic white women. In addition, there was a significant increase in obesity among men between 1999 and 2004. Wang and Beydoun (2007) estimate that by 2015, 75% of U.S. adults will be overweight and 41% will be obese.

A Canadian study of the elderly (1996-1997 Canadian National Population Health Survey) found the rates of overweight and obesity to be 39% and 13% respectively for adults age 65 and above. Men were 57% more likely to be overweight and 37% more likely to be obese than women. Researchers determined that demographic variables were the most important predictors of obesity for this age group (gender, education, age, marital status, and place of birth) (Kaplan, Huguet, Newsom, McFarland, & Lindsay, 2003)

Life Course Effects on Weight Gain/Obesity

Although the prevalence for obesity has increased at all ages in the past decade and for successive cohorts (Utz, 2005), Fawzy et al. (1983) state that obesity is most prevalent at age 40 and prevalence rates fall at age 50 perhaps due to mortality associated with cardiovascular disease among the older obese. Ferraro, Thorpe, and Wilkinson (2003) found prevalence of severe obesity is highest between ages of 45-64. This curvilinear pattern is supported by others such as Ferraro and Booth (1999), Taylor and Ostbye (2001) and Wang & Beydoun, (2007). Utz (2005) in examining average BMI over the life

course by cohort using 5 waves of the NHANES dataset, however, shows an absence of the downward trend in BMI at later stages. Rather she shows that individuals gradually get fatter throughout adulthood (although the rate of increase is lower compared to earlier life stages).

Marriage and Weight Gain/Obesity

Several studies show a link between marriage, weight gain, and obesity (Hedblad, et al., 2002; Kahn & Williamson, 1990; Kahn et al., 1991; Lipowicz et al., 2002; Meltzer & Everhart, 1995, 1996; Shafer, 2010; Sobal et al., 1992). Christakis and Fowler's (2009) network analysis over 32 years found that among married couples, when one spouse became obese, the other spouse had a 37% increased risk of also becoming obese. Husbands and wives affected each other similarly (44% risk for husbands and 37% risk for wives) (Christakis & Fowler, 2009). The married are more likely to be overweight and less likely to engage in exercise than the nonmarried (Hayes & Ross, 1986; Ross & Mirowsky, 1983; Venters, 1986). Some have suggested that the shared environment after marriage is related to activity and dietary behaviors that increase obesity (Anderson, Marshall, & Lea, 2004; Burke, Beilin, Dunbar, & Kevan, 2004). Specifically, Anderson et al. (2004) found that greater emphasis was placed on sharing the evening meal together and that this meal be a 'proper meal' (a cooked meal). Living with a partner also meant dealing with food temptations and sharing these temptations reduced guilt and increased food consumption. Women, in particular increased their intake of alcohol. Burke et al. (2004) found that men living with a partner reduced their intake of total and saturated fat and overall food intake compared to women living with a partner, who increased their fat

and energy consumption. However, men living with a partner reduced their level of fitness, while women increased their fitness. For men, 53% of those living with a partner were inactive. For women, 45% of those living with a partner were inactive (at 25 years of age).

In terms of weight gain and obesity, most studies suggest that marriage may be detrimental. In a Japanese sample, spousal BMI correlations increased for both short duration and long duration marriages (Inoue, Sawada, Suge, Nao, & Igarashi, 1996). Similarly, Lipowicz et al. (2002) found that married individuals had higher BMI than the never married at each age and educational level group. The most significant predictors of obesity for men were age and marital status and for women were age, marital status, and education.

In an examination of overweight and obesity by marital status, Schoenborn (2004) found that prevalence varied by age and gender within marital status groups. Among adults age 18-44, highest rates of overweight and obesity were found for married men (70.3%) and for widowed men (70.5%). Middle aged married men (age 45-64) had the highest rates of overweight and obesity at 75.2%, while married middle aged women had lower rates of overweight/obesity (55.6%) compared to women who were divorced or separated, never married, or widowed (59.3%, 64.4%, and 64.8% respectively). For adults 65 and over, married men also had the highest rates of overweight/obesity (65.2%) compared to the other marital status groups. There were no statistical differences in weight status for women in this age group. Overall, when looking at age adjusted prevalence of overweight and obesity for all adults age 18 years and over by marital

status, prevalence rates were higher for men (65.1%) than for women (48.5%) and never married adults were less likely to be overweight or obese compared to individuals in all other marital status categories. These prevalence rates show that overweight and obesity levels in North America are at alarming rates, and appear to be worse for other than the never married and for married men at midlife in particular.

Finally, in examining marital status changes in relation to weight status changes over time, Rauschenbach, Sobal and Frongillo (1995) found that women who got married over the one year follow-up lost less weight than those who were already married. Men's weight did not change over the one year. Similarly, Sobal, Rauschenbach and Frongillo (2003) found that women who were initially single and then married before the ten year follow-up had gained more weight than women who were married at both times. Men that remained divorced, separated, or widowed over the ten years lost more weight than men who were married. The authors suggest that change in social roles influences weight gain or loss. Umberson, Liu, & Powers (2009) state the marital transitions are more important than marital status when predicting changes in weight. Divorce and widowhood have a stronger effect on weight change (causing weight loss) than marriage (causing weight gain).

Explaining Weight Gain/Obesity

Regardless of genetic predispositions to body type, weight is largely a function of energy consumed and expended over time. Thus, small changes made consistently may have a cumulative effect on weight status. How does marriage influence energy consumption and expenditure?

Eating. Research on the social influence of eating focuses on three areas: (a) the social facilitation of eating, where eating with others increases the amount of food eaten at a meal; (b) impression management, where the presence of others results in decreased amounts eaten as individuals attempt to portray a positive image of themselves; and (c) modeling, where the presence of another person can increase or decrease the amount of food consumed, depending on the amount eaten by the model (Herman, Roth, & Polivy, 2003). Social facilitation of eating has been studied using both food diaries as well as experimental manipulations. "This social influence is the best predictor of how much food an individual will consume, independent of when the individual eats, where the individual eats, whether the eating episode is a meal or a snack, and whether the eating episode occurs on a weekday or weekend" (Redd & de Castro, 1992, p. 749). De Castro and Brewer (1992) found that individuals eat 28% more with one other person present, 41% more with two additional people present, 53% more with three or four additional people present, 71% more with five additional people present, and 76% more with six additional people present at a meal than when they eat alone.

The most widely accepted explanation for the social facilitation of eating effect is the 'time-extension' hypothesis, where meal length increases as the number of eaters increases. This time extension in turn increases the amount eaten (Pliner, Bell, Hirsch, & Kinchla, 2006). De Castro and Brewer (1992) suggest the amount eaten can be described as a power function of the number of people present. However, unlike de Castro and Brewer (1992), Clendenen, Herman, and Polivy (1994) found when manipulating group size, pairs took significantly longer to eat than those eating alone and in groups of four.

Pairs may be modeling each other's eating behavior. In larger groups, monitoring the intake of several additional people may be difficult, thus individuals may not be able to model the eating behavior of a larger group (Pliner et al., 2006). Pliner et al. (2006) manipulated meal duration to see if the effect of consuming more food was due to meal duration or number of individuals present, and found that participants in the longer meal condition ate more than those in the shorter meal condition. Group size had no effect (beyond eating alone). Males overall ate more than females.

Clendenen et al. (1994) found that the type of dining companion mattered. Friends ate more cookies than individuals who were with strangers as dining companions supporting the notion of impression management. Thus, eating with strangers causes reduced intake in order to manage impressions. Hetherington, Anderson, Norton, and Newson (2006) further examined the social facilitation effect on eating with friends and strangers. "Eating with strangers differs from eating with friends and family, since it involves both monitoring what is being eaten (self-presentation) and what others eat (modeling, social norms), thus it could be argued that in the case of eating with strangers attention is divided between two different domains (self and others). "If intake is limited by self-monitoring, eating with strangers might inhibit food intake" (Hetherington et al., 2006, p. 499). The authors found that sweet, high fat foods were consumed in greater quantities when eating with friends than when eating alone, supporting the notion that social facilitation may be greater for specific food types. Redd and de Castro (1992) also found meals eaten alone were lower in fat and salt while alcohol intake was higher in meals eaten with others. Hetherington et al. (2006) also found that the social facilitation

effect on eating did not occur when eating with strangers. Thus, time extension alone does not account for social influence on intake. Eating with strangers may cause self-monitoring which inhibits eating while eating with family and friends may distract from the focus on food, increase meal duration, and thus increase consumption. Having a marital partner therefore, provides for consistent distraction (focus on conversation rather than food consumed) and increased meal durations over time.

Emotional states can also affect food intake. Several reviews have been done linking emotional eating and body weight (Allison & Heshka, 1993; Faith, Allison, & Geliebter, 1997; Ganley, 1989; Van Strien, 1995). These generally focus on negative emotions such as depression and anxiety and compare obese with normal weight subjects. Ganley (1989), in his review of the literature on the link between emotion and eating for obese individuals states this link is very prevalent for those individuals who seek treatment for obesity. For example, a clinical treatment study by Atkinson and Ringuette (1967) showed that 2/3 of subjects reported eating which was triggered by emotional arousal including family stress. Similarly, Kollar, Atkinson, and Albin (1968) indicated that consumption and weight gain occurred during personal and family crises. A study of a non-eating disordered sample shows the same effect, overweight/obese individuals eat more during negative emotional states (Geliebter & Aversa, 2003).

Affect regulation theory is used to explain this phenomenon. Eating serves to reduce the negative affect one is feeling (Kenardy, Butler, Carter, & Moor, 2003). Kenardy et al. (2003) found that the mood of individuals changed following food consumption. The greatest change in mood was for those who were in the negative mood

condition. Subjects in the positive mood condition had reductions in both positive and negative mood following eating. Thus, the mood invoked by marital partners may influence emotional eating if the emotions are negative. Markey, Markey, and Birch (2001) found, for example, that for wives, unhealthy dieting was related to high BMI, weight concerns, depression, low self-esteem, poor marital quality, lack of marital harmony, lack of love, and little understanding for and from their spouse. Similarly, a conflictual family environment was found to hamper an obese person's ability to deal with psychological changes encountered in weight loss programs (Fawzy et al., 1983) thus causing them to regain weight.

Exercise. Social support is positively related to exercise behavior (Carron, Hausenblas, & Mack, 1996; Gabriele, Walker, Gill, Harber, & Fisher, 2005). Support from nonfamily members had a stronger influence on exercise behavior than support from family members (Carron et al., 1996). Being married and having children is associated with lower levels of physical activity (Spanier & Allison, 2001). Nomaguchi and Bianchi (2004) argue that exercise "requires focused energy and often cannot be combined with other activities or with the care of children" (p. 414). There are two perspectives used to explain how family roles influence leisure (Nomaguchi & Bianchi, 2004) which include (a) the time availability perspective, where time is a limited resource that people use to fulfill family, work and self obligations and (b) the time deepening phenomenon, where it is believed that busy people use their time efficiently finding ways to combine obligations by doing more than one activity simultaneously (Nomaguchi & Bianchi, 2004). These authors found support for the time availability perspective, stating

that marriage and parenthood reduces time for exercise. They also found that married men were more motivated to find time to exercise than married women. Research on the elderly, however, suggests that married individuals participate in exercise more often than nonmarried individuals (Pettee et al., 2006; Satariano, Haight, & Tager, 2002; Schone & Weinick, 1998). Thus, it is important to take life course stage into consideration.

Consequences of Weight Gain and Obesity

Overweight and obesity have been linked to cardiovascular disease, type 2 diabetes mellitus, hypertension, stroke, dyslipidemia, osteo-arthritis and some cancers (Burton, Foster, Hirsch, & Vanitallie, 1985; Must et al., 1999). Lake, Power, and Cole (1997) found evidence of subfertility as well as an increased risk for menstrual problems and hypertension during pregnancy. Obesity is also linked to higher risk for uterine cancer (cervical and endometrial) (Barber, 1981). Adjusting for sociodemographic, biological, and lifestyle related factors, obese women smokers also had delayed conception (no association for non-smokers) (Bolumar, Olsen, Rebagliato, Saez-Lloret, & Bisanti, 2000).

Several studies show a link between obesity and depression (Chen, Jiang, & Mao, (2009); Onyike, Crum, Lee, Lyketsos, & Eaton, 2003; Patt, Yanek, Moy, & Becker, 2004; Roberts, Kaplan, Shema, & Strawbridge, 2000; Rumpel, Ingram, Harris, & Madans, 1994; Strine et al., 2008; Zhao, Ford, Dhingra, Li, Strine, & Mokdad, 2009). Roberts, Strawbridge, Deleger & Kaplan (2002) tested the hypothesis that the fat are more jolly using a sample of older adults 50+ in Alameda County, California. They

found no protective effect of obesity on 8 mental health indicators (happiness, perceived mental health, life satisfaction, positive affect, negative affect, optimism, feeling loved and cared for, and depression). Over time, the obese were at increased risk for unhappiness, pessimism, low positive affect, life dissatisfaction, and depression. When controlling for baseline mental health and covariates (e.g. age, gender, education, marital status, chronic medical conditions, physical activity, financial strain, recent life events, social isolation, and social support), increased risk was limited to depression. Both cross-sectionally and in the long term, the fat are not jollier.

Ross (1994) offers two explanations for the link between obesity and depression: (a) the self-appraisal perspective, where stigma toward the obese may cause a decrease in self-esteem and an increase in negative self-image and depression; and (b) the fitting norms perspective, where it is hypothesized that for the obese, fitting the norm for weight is stressful because dieting is stressful especially when not successful. Ross found support for the second hypothesis. It was the act of dieting and failing that caused depression, not being obese in and of itself.

With respect to the social and economic consequences of obesity, research from the Australian Longitudinal study on Women's Health found that obese women aged 18-23 were less likely to aspire to complete further education which may then lead to lifelong socioeconomic disadvantage (Ball et al., 2004). These women were also more dissatisfied with work/career/study, family and partner relationships, and social activities. Satisfaction with friendships did not differ among weight groups perhaps because friends are less discriminating against weight than family. Over time, obesity was associated

with decreased life satisfaction. The obese tended to be in self-employed or unpaid work in the home rather than full-time employment and were less likely to be satisfied with partner relationships (Ball et al., 2004). Those who lost weight over the 4 years of the study were less likely to aspire to have children. Gortmaker, et al., (1993) similarly found that obese women completed less school, were less likely to be married, had lower incomes, and were more likely to be in poverty than women of normal weight. Obese men were less likely to be married. Likewise, Averett and Korenman (1996) also found obese women to have lower family income. This was due to differences in marriage probability and spousal earnings. They found no differences in income levels for African American women in this study, regardless of weight status.

The costs of obesity in terms of health care and productivity are also at alarming rates. The direct and indirect annual cost of obesity was reported as $51.64 and $47.56 billion dollars (1995 dollars) respectively (Wolf & Colditz, 1998). And morbidity related to obesity was estimated to account for 6.8% of US health care costs. A more recent study suggests that medical costs in the U.S. attributed to obesity are estimated to have increased to $147 billion annually (Finkelstein, Trogdon, Cohen & Dietz (2009). Estimates of the costs of weight loss products and services spent by individuals are at $33 billion per year (U. S. Congress, 1990).

Theoretical Explanations for the Relationship between Marriage, Health and Weight Gain/Obesity

How does marriage promote health and well-being? As noted earlier, researchers have taken three different approaches: (1) The effect is spurious due to selection (healthier people are more likely to get married, creating a difference that persists over time); (2) The effect is causally meaningful as marriage promotes healthy behaviors and lifestyles, discourages negative health behaviors and provides resources protective of health; and (3) The effect is conditional based on marital quality, gender, and/or life course stage. Each of the approaches will be examined further below, with consideration given to how they might intersect with the effects of marriage on weight gain and obesity.

Selection Effects

One explanation for the link between marriage and health is selection. The basic notion behind the selection hypothesis is that healthy people choose and marry partners that are similarly healthy, while the unhealthy have trouble finding and keeping a marriage partner. This explanation is based on rational choice or exchange theory models which state that partners search for the best possible match among potential partners and offer their own resources in exchange (Becker, 1974). Theories of mate selection such as assortative mating (Murstein, 1972; South, 1991, 1992) also explain this phenomenon of decreased choice. Murstein's stage theory suggests that attractiveness is critical in the initial stage of relationship development. In later stages, behavior and attitude become more important (Murstein, 1980) but one must pass the initial 'attractiveness' stage in order to progress to an evaluation of behavior and attitude compatibility. A general

condition of health and, in particular, possessing outward physical traits that signify health such as normal body weight, are important criteria of attractiveness.

Research by Fu & Goldman (1996) support a selection hypothesis explanation based on the association between weight and health as they found that obese women had lower rates of marriage compared to non-obese women – almost half as likely. Obese men also had a lower rate of marriage compared to normal weight men (about 20% lower), but, overweight men were 18% *more* likely to get married than normal weight men. These findings held true even when expectations about age at first marriage are taken into account. Further, the reduced chance of marriage is even greater for overweight and obese women at older ages than at younger ages. Thus, differential selection into marriage based on weight - and the potential for future negative health conditions - does occur, suggesting that this may be an alternative methodological explanation for the marriage-health association. More recently, research by Carmalt, Cawley, Joyner and Sobal (2008) also supports this perspective as they found that obese men and women had a lower probability of having a physically attractive partner, especially white women.

Although weight has been shown to affect the likelihood of marriage, Tucker, Friedman, Wingard, and Schwartz (1996) only partially support the selection hypothesis, at least with respect to the lower mortality rates found among married individuals. They found (in terms of selection effects) that, personality characteristics (e.g. conscientiousness) and family-related stressors (e.g. lack of parental divorce) were more prevalent among the married and predict lower mortality among the married. However,

mortality differentials were not related to initial health status. In other words, despite evidence for selection effects in marriage, individuals who were less healthy over time did not start off less healthy compared with those who remained healthy over time. Horwitz et al. (1996) have also shown that the health benefits of marriage are not simply accounted for by the selection of healthier people into marriage. The authors found that those who married and stayed married had less depression and alcohol problems than those who remained single even when controlling for prior problems. Selection effects were only found for women, where depressed women were more likely to remain single. Thus, although there have been studies that contradict a strict selection hypothesis in that positive health outcomes for the married are due to initial health conditions, it could be that a less strict interpretation of selection is operating insofar as a greater likelihood of initial weight normality among the married may lead to their more positive health outcomes, as suggested by Fu & Goldman (1996) and Carmalt et al. (2008) above.

Causal Processes

According to the protection hypothesis, the differences in health between the married and unmarried are due to greater social, economic, and emotional support marriage provides (Ross et al., 1990; Umberson, 1992; Williams & Umberson, 2004). Marriage decreases vulnerability to stress, provides material resources, facilitates health promoting behaviors, and increases availability/quantity of social support (Whitson & El-Sheikh, 2003) thereby improving health. Marriage can improve physical health by (a) improving emotional health, (b) reducing risk taking behavior, and (c) aiding in early detection and treatment of illness (Ross et al., 1990). Thus, in spite of the observed

greater increases in weight found among the married, there may not be a corresponding decrease in health either because the greater weight gain is less likely to achieve levels that result in increased morbidity and mortality or because these forces counteract the potential negative outcomes of weight gain in terms of health.

One important aspect of life that may enhance health outcomes and that marriage may provide significant benefit to, is the area of social support. Berkman, Glass, Brissette, and Seeman (2000), propose a model showing that social "networks operate at the behavioral level through four primary pathways: (1) provision of social support; (2) social influence; (3) social engagement and attachment; and (4) access to resources and material goods" (p.846). These lead to improved health status through: " (1) direct physiological stress responses, (2) psychological states and traits including self-esteem, self-efficacy, security, (3) health-damaging behaviors such as tobacco consumption or high-risk sexual activity, (4) health promoting behavior such as appropriate health service utilization, medical adherence, and exercise, and finally (5) exposure to infectious disease agents such as HIV, other sexually transmitted diseases (STDs) or tuberculosis" (p.846).

"Social support is the commitment, caring, advice and aid provided in personal relationships" (Ross et al., 1990, p.1062). Weiss (1974) categorizes support as emotional, instrumental, appraisal, and informational. With respect to the dimension of emotional support, Thoits (1995) includes love, caring, sympathy, understanding, esteem, and value available from others. Appraisal support consists of help in decision making and feedback (Berkman et al., 2000). Instrumental support is assistance with tangible needs (Berkman et al., 2000) or aid in kind, money, or labor (House, 1981).

Informational support is related to advice or information relating to specific needs (Berkman et al., 2000).

Social support slows mortality (Berkman & Syme, 1979) and contributes to physical and psychological health. Berkman et al. (2000) found increased survival rates and decreased morbidity for older adults who have strong social ties. More specifically, Ryff and Singer (2005) state that individuals reporting positive relationships throughout life reported fewer physiological risk factors for cardiovascular, neuroendocrine, metabolic, and sympathetic nervous system problems in later life compared with individuals with problematic or few relationships. Thus, marriage may enhance health by expanding the opportunities for and enhancing social engagement, which will, in turn, expand social roles and provide more opportunities for companionship. These roles also give meaning to a person's life through feelings of attachment and obligation (Berkman et al., 2000); although not all social ties are supportive and there is variation in the "type, frequency, intensity, and extent of support provided" (Berkman et al., 2000, p. 848).

Marriage also increases psychological well-being more directly (Gove, Huges, & Style, 1983; Pearlin & Johnson, 1977; Wood, Rhodes, & Whelan, 1989). Bowlby (1969) viewed the attachment bond in marriage as the adulthood equivalent of the mother-child bond in childhood. Secure marriage provides a secure base for an individual to explore the world acting as "a protective shell in times of need" (Holmes, 1993, p.81). Thus, marriage may be one of the most important sources of social support available. Regular contact with someone who provides encouragement and builds self-esteem through feelings of being valued and loved promotes well-being (Tucker et al., 1996) and

psychological well-being improves physical health over time (Friedman, 1991; Mechanic & Hansell, 1987).

In addition to enhancing social supports and the direct attachment benefits of marriage, relationships such as marriage, can impact health through changes in mood and influences on health habits (Robles & Kiecolt-Glaser, 2003). Marriage may protect health by encouraging individuals to engage in a healthier lifestyle, by for example, reducing risk taking behavior such as excessive alcohol, drinking and driving, and substance abuse (Umberson, 1987) and engaging in health promoting behaviors such as exercise and seeking medical care when needed. Hughes and Gove (1981) and Umberson (1987, 1992) found married individuals were less likely to engage in unhealthy behaviors than the unmarried. Chassin, Presson, Rose, and Sherman (1996), for example, found both married men and women were less likely to be current smokers than the single, divorced, or separated.

The married also tend to be more financially secure than the non married (U.S. Bureau of the Census, 1990, 1991) and have higher median household incomes (US$54,300 and US$23,400 respectively) (US Census Bureau, 1999). These differences are consistent with the marriage protection hypothesis. Research shows clearly that mortality and morbidity are reduced for those with higher financial resources compared with those who lack such resources (Haan, Kaplan, & Camacho, 1987; Kitagawa & Hauser, 1973; Marmot, Kogevinas, & Elston, 1987). Thus, it may be that those who are married are healthier simply because they are also more likely to be economically secure.

Gove (1984) found that marriage protects men's physical health and psychological well-being more than women's. This may be due to both differences in social support provided as well as influences on healthy behavior. For example, in a study on cardiovascular response to stress, it was shown that social support received from a woman reduced cardiovascular changes for both genders; however social support received from a man did not (Glynn et al., 1999). Although this study was not of married couples, it may suggest why marriage is more profitable in terms of health benefits for men. Also, since women generally have a healthier lifestyle than men, this may explain why marriage improves men's health more than women's (Umberson, 1987). There may be fewer risky health behaviors to change in women to begin with. Ross et al. (1990) found, however, that the economic benefits of marriage stand for both genders even when adjusted by age, race, employment status, and education. Thus, marriage may have greater social and emotional impact on men rather than on women, but economically, marriage provides both genders an advantage over the unmarried.

Conditional Effects

Are all marriages equally beneficial to health? Conditional effects such as marital quality may account for variation in health benefits as well as weight gain/obesity. Griffin and Holmes (1997) for example, show that marriage benefits health only when the marriage is happy, with changes in the quality of marriage preceding changes in physical health. Happier spouses were more likely to do things that were good for them.

Marital quality. Defining marital quality has been conceptually and methodologically problematic. Marital adjustment is defined as the functioning of

marital partners and includes concepts such as marital happiness and satisfaction (Spanier & Cole, 1976). Fincham and Bradbury (1987) however, argue that the measure of marital quality or adjustment is confounded with other concepts (e.g. communication) and should focus on a global evaluation of the marriage. More recently, separate dimensions for positive and negative quality have been proposed by Fincham, Beach, and Kemp-Fincham (1997). Separate dimensions allow distinction between indifference (caring about nether satisfaction or dissatisfaction in the marriage) and ambivalence (caring about both satisfaction and dissatisfaction). Empirically, separate dimensions for positive and negative marital quality have been established through an examination of correlations and factor analyses (Fincham et al., 1997; Fincham & Linfield, 1997; Gable, Reis, & Elliot, 2003; Huston & Vangelisti, 1991).

Riessman and Gerstel, 1985 (as cited in Whitson & El-Sheikh, 2003) state there are two ways to look at marital quality and its impact on health which correspond to the separate dimensions of marital quality proposed above. According to the stress buffering hypothesis, "the negative consequences of stress are *diminished* by the presence of social support…" If support is greater in higher quality marriages, then it is reasonable to conclude that it is "the *quality* of the marriage [that] impacts the effectiveness of the protective function of marriage rather than marital status per se" (p. 288). This hypothesis focuses on the positive dimension of quality in a marriage. In contrast, the social strain hypothesis states that "not only do unfulfilling marriages fail to protect the individuals involved but can also *impede* the well-being of the marriage partners…A poor marriage can have a detrimental effect on the health of the partners" (p.288). This last

hypothesis suggests that it is important to go beyond the assumption that all marriages provide social support (positive quality), but rather that the negative aspects of marriage or negative quality plays a role on the impact of marital quality on health.

Positive marital quality is associated with higher levels of well-being and health for individuals across the life course. For example, Prigerson, Maciejewski and Rosenheck (1999), using a sample of women age 24-60, show that marital harmony (a scale including both objective characteristics of adjustment, such as absence of conflict, as well as degree of satisfaction) was associated with better sleep, less depression, and fewer physician visits. They suggest that marital harmony promotes health and provides a husband to whom health concerns can be expressed. Wickrama, Conger, and Lorenz (1995) found for a sample of married men, control over work and positive marital interactions reduced risky lifestyle behaviors despite variations in economic status. Quirouette and Gold (1992) report that for older couples, the relationship between marital satisfaction and health is stronger for women than men. Similarly, Levenson, Carstensen and Gottman (1993) found older women in dissatisfied marriages reported more mental and physical health problems.

The effects of positive marital quality are also related to physiological response. Allostatic load is the price the body must pay for being forced to adapt to adverse psychosocial or physical conditions (Ryff & Singer, 2005). This load increases when there is too much adaptive responding to challenges, or when the adaptation becomes inefficient when response systems are repeatedly turned on and off (McEwen, 2000). Ryff and Singer (2001) found that allostatic load decreased for a sample of midlife men

and women who had positive relationships both in childhood and adulthood. Seeman, Singer, Ryff, Love, and Levy-Storms (2002) similarly found that older men (aged 70-79), who were socially integrated and reported frequent emotional support from others had lower allostatic load than those who lacked these relational benefits. Results were not significant for older women, thus positive relationships were more important in the reduction of allostatic load of older men.

Negative marital interaction is associated with poor physical and psychological health (Horwitz, McLaughlin, & White, 1998). In fact, the average frequency of marital conflict is one to two times per month, making it a common part of marital relationships, both good and bad (McGonagle, Kessler, & Schilling, 1992). A troubled marital relationship is one of the most powerful predictors of distress (Paykel et al., 1969) and can have a stronger impact on well-being than a positive one (Rook, 1984, 1998). Negative marital functioning, such as high levels of conflict, indirectly influences health by increasing depression and poor health habits and directly influences physiological mechanisms such as cardiovascular, endocrine and immune functions (Kiecolt-Glaser, Glaser, Cacioppo, & Malarkey, 1998; Kiecolt-Glaser & Newton, 2001). These latter effects on physiological mechanisms are particularly pronounced among women (Kiecolt-Glaser et al., 1993). Negative marital relations have a similar or even greater impact across the life course. Negative spousal behaviors decreased physical health in 50+ year olds (Bookwala, 2005) and was found to have the greatest impact on self-reported health in old age (compared to younger ages) (Umberson, Williams, Powers, Hui, & Needham 2006).

Given the documented effects of both positive and negative marital quality on health, the question remains as to which of these aspects of a relationship has a greater impact on health and well-being (Rook, 1992). Christensen and Heavey (1999) describe the process of 'habituation and satiation' where the value of positive acts that were rewarding early in the relationship, lose value over time. Negative acts, however, retain their power over time as they go against the expectation of being treated well in a relationship. Gottman and Krokoff (1989) have shown that negative behaviors are more highly correlated with relationship satisfaction than positive behaviors, and research by Taylor (1991) concludes that " negative events appear to elicit more physiological, affective, cognitive, and behavioral activity … than neutral or positive events" (p. 67).

The comparison between positive and negative quality in relation to health is problematic however, as researchers have studied a broader spectrum of negative interaction measures than positive interaction measures (Rook, 1998). In addition, it could be that certain combinations of positives and negatives are what make the greatest difference with respect to health outcomes. Horwitz et al. (1998) have found that the difference in amounts of supportive and problematic sides of relationships are more important than the absolute level of either in predicting mental health of relationship partners. Similarly, Ries (2001) argues that relationships which promote health are those that have a combination of positive and negative emotions rather than simply a lot of good but absence of bad feelings.

In addition to the need to measure and test a wider variety of positive components (Rook, 1998), another methodological issue to consider when assessing marital quality is

an accumulation bias. As positive events are more common in day to day life, a simple numerical tally of positives versus negative events that occur over a given period of time does not capture the underlying nature of what that ratio means to a given individual or couple. It is important to examine the ratio of positive to negative events, but negative events may have more impact than positive ones. As Reis and Gable (2003) suggest, dealing with differences in the strength of positive versus negative events are necessary, but difficult.

There are several additional methodological issues to consider in relation to marital quality. A major problem in assessing the impact of poor marital quality is that many of the really 'bad' marriages have already dissolved and are not part of the sample studied. Marital quality is usually based on self-report measures and most people report 'happy marriages' (Norton, 1983). This may be because the unhappy marriages have already dissolved or be due to social desirability bias. Cognitive dissonance theory would also suggest one may believe the marriage is good in order to justify staying in it. Brennan and Barnett (1998) have found that self-reports have underlying dimension of negative affectivity, especially for those who are depressed, which impacts results. In terms of the relation between marital quality and health, it is hard to disentangle poor marital functioning and poor health habits which are related (Kiecolt-Glaser & Newton, 2001).

Marital quality and depression. Of particular interest is the link between marital quality and depression. The relationship between marital quality and depression is thought to be bi-directional in nature. People in unhappy marriages report higher levels

of depression (Beach, Katz, Kim, & Brody, 2003; Beach, Nelson, & O'Leary, 1988; Dew & Bromet, 1991; Whisman, 2001) and depressed individuals report more unsatisfying marriages (Birtchnell, 1988). This bidirectional effect is supported by Davila, Karney, Hall, and Bradbury (2003). However, the pattern of change over time for marital quality and depression is not identical. Their findings show that marital satisfaction declines linearly over time while depressive symptoms do not show a systematic change over time but rather wax and wane.

Stress models suggest depressed individuals behave in ways that contribute to interpersonal conflict and stress which then increases depressive symptoms (Davila, 2001). Thus the process is cyclical. Coyne, Thompson, and Palmer (2002) found that depressed individuals had more destructive ways of coping with conflict. Beach et al. (2003) found that spouses affected one another – husbands earlier (1 year) marital satisfaction predicted wives' later depression and wives' earlier marital satisfaction predicted husbands' later depression.

According to models of mate selection, depressed individuals may 'match' (choose partners who are also depressed). In fact, Murstein (1967) found that couples rated similarly on mental health status had more progress in their courtships than those who were dissimilar regardless of whether the mental health status was good or poor, thus providing evidence for the 'matching hypothesis' even in areas of mental health.

The bidirectional effect may also be due to gender differences. Gender differences in this relationship were found by Fincham, Beach, Harold, and Osborne (1997) where for men, depression caused marital dissatisfaction while for women, marital

dissatisfaction caused depression. This may occur because women are more likely than men to focus on problems in the marriage and blame themselves for these problems, putting them at higher risk for depression (Nolen-Hoeksema, 1987) while men may be less likely to become depressed in response to marital problems as they are more prone to withdraw from conflict or the relationship. Similarly, Culp and Beach (1998) suggest that intimate relationships are central to women's personal identities but not to men's. Further, based on a twin study in Sweden, relationships accounted for 18-31% of the variance in depressive symptoms for women (Spotts et al., 2004). Kurdek (1998, 1999) however, did not find these gender differences. Gender differences have been found to decrease with marital duration as with age, gender roles tend to converge in North America with married men becoming equally invested in marriage (Beach, et al., 2003).

Depression and overweight/obesity. The link between depression and obesity is also bi-directional. Being overweight/obese has been linked to later depression (for example Carpenter, Hasin, Allison, and Faith, 2000 found that obesity was related to a 37% increase in major depression for high socioeconomic status women but decreased depression for women with low SES). Chen et al., (2009) found that being obese increased risk of depression by 30%, specifically for women 18-39 years of age. Heo, Pietrobelli, Fontaine, Sirey and Faith (2006) similarly found that young (18-64) overweight and obese women were more likely to experience depression than non overweight/obese women. Young overweight (but not obese men) were also more likely to experience depression (controlling for race and SES). This association may not hold

true for the elderly as Heo et al. (2006) found depression was not associated with obesity for individuals of both genders over 65 years of age.

However, Blaine (2008) conducted a meta analysis of 16 studies consisting of 23 samples that assessed the association between depression and body mass index. Cross sectional evidence for this link is weak at a correlation of .08 (National Center for Health Statistics, 2006) but an assessment of longitudinal models showed that 18 of the 23 samples studied in the meta analysis supported that depression caused weight gain. Depression was thought to cause obesity indirectly through emotional eating, decreased physical activity and eating calorie rich foods (Dallman, Pecoraro, & la Fleur, 2005). The depressed at baseline were 1.8 times more likely to have weight gain or obese status at follow-up than the non-depressed. This was especially true for female adolescents although controlling for age, sex and baseline BMI no gender differences in the likelihood of gaining weight/being obese were found. The samples that showed a reduction in weight following depression consisted of older subjects (over 65) (Blaine, 2008).

Strine et al. (2008) similarly found current depression or a lifetime diagnosis of depression was related to being obese and physically inactive compared to those with no current depression or lifetime diagnosis of depression. This relationship remained even after controlling for sociodemographic factors (age, sex, race/ethnicity, education, marital status, and employment status). A history of depression (being previously depressed) was related to both genders being more likely to be obese and (for women only) being physically inactive. Those with current depression had two times the physical inactivity

levels than those who were not currently depressed. Further, Murphy et al. (2009) found that the obese compared to the non-obese were five times more likely to overeat leading to weight gain during a period of depression. They also found in their sample of adults 18 and above, the obese had more episodes of depression which also lasted for longer periods than the non-obese.

Life Course Stage. Does marriage provide health benefits throughout the life course? Is this benefit cumulative? Pienta et al. (2000) suggest that marriage may only provide protective effects on health during the early years of marriage. In contrast, Prigerson, Maciejewski, and Rosenheck (2000) found happy marriages had a protective effect on health until widowhood. The widowed then had higher health costs, perhaps because they were not prepared for life as singles after being married for many years. In any case, marital duration was not found to have as strong a correlation with physical health (Knuiman, Divitini, Bartholomew, &Welborn, 1996) as one would expect if marriage had cumulative effects on health.

Perhaps marital quality can explain the lack of cumulative effects of marital duration on health. Wickrama, Lorenz, Conger, and Elder (1997) show a link between marital quality and declining physical health over a three year period. Umberson et al. (2006) show that marital strain does in fact have a cumulative effect on health. They use latent growth curve analysis to determine the impact of both positive and negative marital quality on health over an eight year period. They found that in general, positive marital quality decreased and negative marital quality increased over time. Further, those individuals with higher levels of positive initial marital quality had higher initial self-

rated health, although negative marital quality was not associated with initial levels of health. However, the rate of change in health did depend on the age of respondent and negative marital quality. At high levels of negative marital quality, the oldest respondents had a higher rate of health decline than younger respondents. They also found that the absence of negative marital quality had health benefits for the oldest old. In addition, marital quality's effect on self-rated health was similar for both men and women across the life course (when demographic and social resources were controlled). House et al. (1992) suggest that marital strain along with increasing biological vulnerability that comes with age may cause marital quality to have a stronger effect on health in later life.

However, the limitation of longitudinal studies on marital quality and health is that through divorce, poor quality marriages may have been removed from the population. Thus, the remaining sample of older individuals may be of higher marital quality than at younger ages (Umberson et al., 2006). Thus, these finding must be evaluated with caution.

These studies do show however, the importance of examining the effects of marriage on health over the life course. Elder and O'Rand (1995) define life course theory as "temporal and contextual in locating people in history through birth years and in the life course through the social meanings of age-graded events and activities" (p. 454). In other words, it is important to consider age and contextual effects over time.

Marital transitions. Transitions within life course stages also influence health. Transitions can be assumed to be stressor events (Bulcroft, Bulcroft, & Borgatta, 1988). The crisis model, as described by Williams and Umberson (2004), state that it is the

breakup of a relationship rather than the state of being married that impacts health negatively. There is evidence that strains due to marital dissolution are underlying causes of poor health (Booth & Amato, 1991; Williams, Takeuchi, & Adair, 1992; Williams & Umberson, 2004). Williams and Umberson (2004) found that divorce was beneficial for men in their 30's, not beneficial for men in their 50's and detrimental for men in their 70's. Similarly, Tucker et al. (1996) found that marital breakup had a negative long-term effect on the health of men. This finding however was based on a sample of a mean birth cohort of 1910 (Terman Life-Cycle Study).

Divorce may improve health if it provides relief from a strained marriage. Williams and Umberson (2004) found that for women, the transition to divorce did not undermine self-assessed health at any age. In contrast, transition into first marriage was associated with improvement in men's self-assessed health, but had no effect on women's health. In later years, individuals may focus more exclusively on primary relationships such as marital relationships (Carstensen, 1992), thus a breakup at this stage may have more detrimental effects than at early stages in life (Williams & Umberson, 2004). Thus, it is important to consider life stage in assessing status transitions and their influence on health.

Divorce may have smaller physical health effects (compared to psychological health effects) because physical illness may accumulate over time (Lorenz, Wickrama, Conger, & Elder, 2006). Divorce may be a role change that adds new levels of chronic stress. This may impact women more than men as women endure social isolation and economic hardships as a result of becoming single mothers (Wu & Hart, 2002). Lorenz

et al. (2006) found that divorce for women was significantly related to physical illness (but not depression) ten years after the divorce. Furthermore, remarriage did not decrease the level of illness, supporting the notion of cumulative response of illness to chronic stressors.

Theoretical Hypothesis

In the following sections, I describe how the selection, marital protection, psychological stress, and relationship commitment hypotheses come together to explain the links between marital quality and weight. I propose a theoretical model which accounts for the paths between marital quality, depression, and barriers to leaving on weight. This model is then assessed over time incorporating stability, relationship commitment, marital protection, and psychological stress paths to weight changes over time.

Selection

The selection hypothesis and the principle of homogamy explain why the overweight and obese are less likely to marry (Fu & Goldman, 1996) and why people of similar weight status will marry each other. Given the realities of the marriage market and social norms around attraction and weight, many will keep their weight below normal levels for their body during courtship (impression management) and then once a commitment is established, gain weight (to normal levels for their body and beyond) thus resulting in a positive correlation between marriage and weight/weight gain. Similarly, for those who get married and are already above normal body weight, a greater potential for additional weight gain is also established at marriage by virtue of them forming

relationships with others who are also above normal weight and who are likely to reinforce eating and exercise patterns that sustain existing weight and foster additional weight gain.

With respect to the effects of marital quality on weight/weight gain, however, selection effects are less obvious. Are those who are overweight and get married more susceptible to experiencing lower or higher marital quality than those who are of normal weight? If so, any correlation between marital quality and weight/weight gain could be spurious. There is no clear evidence to suggest that this would be the case, making selection effects inapplicable to the current analysis.

Causal Processes: Marital Protection Hypothesis

Marriage provides social, emotional, and financial supports that promote many types of healthy behaviors and increase the likelihood of good health by reducing stress and increasing psychological well-being. Waite (1995) suggests marriage promotes health through a reduction in risky and unhealthy behaviors, and increases in economic and social well-being. Marriage may also provide a partner who encourages self-regulation or who may monitor health (Ross, 1995; Umberson, 1987, 1992) as well as social support to help deal with stressful life events (Waite, 1995).

The protective aspects of marriage, however, may not be as beneficial when it comes to overweight and obesity. Marriage may be beneficial in reducing negative behaviors that lead to poor health, but it may not promote *positive* behaviors, such as diet and exercise, that would affect weight status. This distinction may help explain the paradox in health outcomes with regards to marriage.

Marriage, for the most part, means shared lives. Shared lives include opportunities for shared meals, similarity in dietary habits (Davis, Forthofer, Lee, & Margen, 1983) and time spent in physical exercise. Anderson et al., (2004) assessed couples three months before and after cohabitation. Results showed an increase in shared meals and alcohol with meals as well as support for dietary temptations/restrictions. Both men and women gained weight during this transition. Similarly, Burke et al. (2004) found cohabitation to be associated with increases in BMI and waist circumference as well as increases in total cholesterol consumed for women and decreases in physical activity for men.

The social facilitation of eating research shows that people will eat more when eating with another individual, especially if this individual is familiar to them (Clendenen et al., 1994; Hetherington et al., 2006). Eating together increases the duration of the meal and thus the food intake for that meal (Pliner et al., 2006). Because married partners no longer need to self-monitor their food intake for impression management, we would expect married couples to be influenced by the social facilitation effect and gain weight. Being married will also reduce body image concerns and thus weight maintenance behaviors such as diet and exercise as married couples are no longer concerned with competing in the marriage market (trying to attract a mate). On the other hand, as most marriages provide social support and a buffer against stress, promoting well-being, most married individuals would be protected from emotional eating (unless in a poor quality marriage). Thus, according to the protection hypothesis, married individuals should gain moderate amounts of weight over the life course relative to the non-married because they

will engage in more social eating and less weight maintenance behaviors, but are less likely to experience weight gain due to emotional eating.

With respect to the effects of martial quality on weight/weight gain, it is likely that the positive effects of marriage on weight gain due to social eating will be heightened when the quality of the relationship is greater - and the negative effects of marital status on weight gain due to emotional well-being will be stronger when martial quality is lower. Thus, individuals with high marital quality will result in increased weight due to social eating and individuals with low marital quality will also increase weight due to emotional eating.

Conditional Effects: Marital Quality and the Psychological Stress and Relationship Commitment Hypotheses

The low quality of a marriage can affect weight gain in two ways. On the one hand, as noted above, low marital quality can increase emotional eating due to ambivalent or stressed relationship conditions. In this case, increasing marital distress should increase the likelihood of weight gain and obesity in marriage by increasing the likelihood of depression (see psychological stress paths in Figure 2). On the other hand, low marital quality is likely to increase the motivation to engage in appearance maintenance behaviors (purposeful dieting and exercise) in preparation for re-entry into the marriage market. In this case, other things being equal, extreme marital distress should result in weight loss as those in distressed marriages prepare themselves for re-entry into the marriage market and high marital quality should increase weight due to a decreased need for appearance maintenance as spouses are not looking to attract a new

mate (relationship commitment hypothesis). However, both of these conditions are moderated by the level of barriers to leaving present in the marital relationship. Theories of marital quality and stability such as that proposed by Levinger (1979) and Lewis and Spanier (1979) suggest that 'barriers' accumulated in marriage help prevent dissolution. Barriers are factors that keep individuals in their marriage and traditionally include, for example, community embeddedness and religious involvement.

Moderators: Barriers to Leaving, Sex, and Age

Despite feeling more or less *personally* committed to one's marriage, barriers to leaving the relationship will also have an impact on subsequent weight gain or loss as they create high levels of *structural* commitment. As Levinger (1979) states, we tend to only think about reasons why we cannot leave a relationship when we are unhappy with the relationship. Under conditions of high marital quality, individuals do not take an account of all the reasons why they must stay in the relationship. However, when there is low marital quality, we would expect individuals to think about why they are 'stuck' in their marriage. Therefore, barriers to leaving should only moderate the relationship between marital quality and depression when marital quality is low. High levels of depression in turn will cause subsequent weight gain. Under conditions of high barriers to leaving, relationship commitment effects are reduced as reduced viability of entering the marriage market makes weight loss less promising (you can't leave so why bother losing weight to look good for others?). In addition, when barriers are high psychological stressor effects are increased as reduced viability of entering the marriage market coupled

with an low marital quality will create feelings of depression due to a lack of alternatives (feeling 'stuck').

Sex will also moderate the effects of the marital protection hypothesis as well as the relationship commitment hypothesis, although these moderating effects should be different. Marriage protection effects will be stronger for men as men need marriage for expressive functioning more than women do (Glynn et al. 1999; Gove, 1984).Thus high marital quality's negative effect on depression and low marital quality's positive effect on depression will be more pronounced for men than for women, resulting in greater impacts on weight/weight gain. On the other hand, feeling less commitment to the marriage due to low marital quality will have a stronger impact on weight loss for women than for men as weight status has a stronger impact on relationship marketability for women than for men (Buunk, Dijkstrat, & Fetchenhauer, 2002).

Older individuals have a reduced viability in the marriage marketplace thus relationship commitment effects will be weaker for older individuals than for younger individuals as weight loss becomes a less promising step towards the market place for older individuals. However, psychological stressor effects will be increased for older individuals as reduced viability in the relationship market combined with low marital quality will lead to feelings of depression due to a lack of alternatives (due to feeling 'stuck'). Therefore, a test of the models by age as well as by sex is warranted as prevalence of overweight and obesity have been shown to vary across the life course and by gender (Schoenborn, 2004) and the paths to weight gain have been proposed to vary by life stage (Bulcroft et al., 1988).

Proposed Models and Conceptual Hypotheses

Structural Model (Cross-sectional Hypotheses)

A structural model depicting marital quality links to weight is shown in Figure 3. The following hypotheses are proposed:

Hypothesis XSECT1. Marital quality is negatively related to depression, which in turn is positively related to BMI. Marital quality will have no effect on weight after controlling for depression as marital quality will reduce depression, which in turn should reduce the likelihood of weight gain through emotional eating.

Hypothesis XSECT2. Marital quality will have a positive effect on weight after controlling for depression (suppressor effect). Counteracting this negative effect on weight through reduced emotional eating, marital quality will increase the likelihood of weight gain through social eating and reduced motivation for weight control through exercise/dieting.

Hypothesis XSECT3a. The relationship between marital quality and depression is moderated by the level of barriers to leaving the relationship. A high level of barriers strengthens the effect of low marital quality on depression (depression in turn increasing weight); whereas a low level of barriers does not affect the link between low marital quality and depression.

Hypothesis XSECT3b. The relationship between marital quality and weight is moderated by the level of barriers to leaving the relationship. A high level of barriers strengthens the effect of low marital quality on weight (due to its enhanced effect on

depression as specified in Hypothesis XSECT2a); whereas a low level of barriers does not affect the link between low marital quality and weight.

Longitudinal Model

Figure 2 depicts the proposed links between marital quality and weight over time. Stability paths, marital protection paths, relationship commitment paths and psychological stress paths are outlined. The moderating effects of barriers to leaving, age and sex are also described. The following hypotheses are proposed:

Longitudinal Model: Stability Paths

Hypothesis LONG1. Marital quality will be positively related to marital quality over time. (Marital quality at time one will be positively related to marital quality at time two; marital quality at time two will be positively related to marital quality at time three). MQ1 → (+) → MQ2 (+) → MQ3. [See figure 2, stability path 1].

Hypothesis LONG2. Depression will be positively related to depression over time. (Depression at time one will be positively related to depression at time two; depression at time two will be positively related to depression at time three). DEPRESSION1 → (+) DEPRESSION2 → (+) DEPRESSION3. [See figure 2, stability path 2].

Hypothesis LONG3. Weight will be positively related to weight over time. (BMI at time one will be positively related to BMI at time two; BMI at time two will be positively related to BMI at time three). WEIGHT1 → (+) WEIGHT2 → (+) WEIGHT3. [See figure 2, stability path 3].

Longitudinal Modal: Marriage Protection Hypothesis

Hypothesis MPROT1. Initial marital quality will act as a buffer against stressors and will reduce the likelihood of an increase in depression, thus marital quality at time one will decrease depression at time two (controlling for depression at time one); marital quality at time two will decrease depression at time three (controlling for depression at time two). MQ1 → (-) DEPRESSION2 (net of DEPRESSION1); MQ2 → (-) DEPRESSION3 (net of DEPRESSION2). [See figure 2, marriage protection path 1].

Longitudinal Modal: Relationship Commitment Hypothesis

Hypothesis RCOMM1. Marital quality at time one will be positively related to BMI at time two (controlling for BMI at time one and controlling for marital quality at time one on depression at time 2); marital quality at time two will be positively related to BMI at time three (controlling for BMI at time two and marital quality at time two on depression at time three). MQ1 → (+) WEIGHT2 (net of WEIGHT1); MQ2 → (+) WEIGHT3 (net of WEIGHT2). [See figure 2, relationship commitment path one]. Initial marital quality will enhance commitment to the relationship and thus reduce consideration of alternatives to the relationship. This will then increase the likelihood of social eating and decreased impression management and thus weight gain. (This effect is net of the counteracting emotional eating effect that occurs for those with low marital quality resulting in high depression).

Longitudinal Modal: Psychological Stress Hypotheses

Hypothesis PSYSTRESS1a. Marital quality will decrease depression and depression will increase weight gain. Thus, marital quality at time two (controlling for

marital quality at time one) will be negatively related to depression at time two (controlling for depression at time one); marital quality at time three (controlling for marital quality at time two) will be negative related to depression at time three (controlling for depression at time two). MQ2 (net of MQ1) → **(-)** DEPRESSION2 (net of DEPRESSION1); MQ3 (net of MQ2) → (-) DEPRESSION 3 (net of DEPRESSION2). [See figure 2, psychological stress path one].

Hypothesis PSYSTRESS1b. Depression at time two (controlling for depression at time one) will be positively related to weight at time two (controlling for weight at time one); depression at time three (controlling for weight at time two) will be positively related to weight at time three (controlling for weight at time two). DEPRESSION2 (net of DEPRESSION1) → (+) WEIGHT2 (net of WEIGHT1); DEPRESSION3 (net of DEPRESSION2) → (+) WEIGHT 3 (net of WEIGHT2). [See figure 2 psychological stress path 3]. Thus, the effect of marital quality on weight is mediated by depression.

Hypothesis PSYSTRESS2. Depression at time one will be positively related to weight at time two (controlling for weight at time one); depression at time two (controlling for depression at time one) will be positively related to weight at time three (controlling for weight at time two). DEPRESSION1 → (+) WEIGHT2 (net of WEIGHT1); DEPRESSION2 (net of DEPRESSION1) → (+) WEIGHT 3 (net of WEIGHT2). [See figure 2 psychological stress path 2].

Moderating Hypothesis: Moderating Effect of Barriers

Hypothesis MODEFF1. When barriers are high, psychological stressor effects are increased as reduced viability of entering the relationship market coupled with low

marital quality will create feelings of depression due to lack of alternatives (feeling stuck). (PSP1 will be negative and PSP2 will be strengthened).

Moderating Hypotheses: Moderating Effect of Age

Hypothesis MODEFF2. Relationship commitment effects will be weaker for the old resulting in lesser weight gain for those with high marital quality as the highly satisfied partner will maintain lower weight in an effort to keep his/her partner's satisfaction high in the relationship; the unsatisfied partner has nothing to gain by keeping trim as reduced viability in the relationship market makes weight loss less promising. (RCP1 will be positive and weaker for the old than for the young).

Hypothesis MODEFF3. Psychological stressor effects will be stronger for the old as reduced viability in the relationship market combined with low marital quality will lead to feelings of depression due to lack of alternatives (feeling stuck). (PSP1 will be negative and stronger for the old than for the young; PSP2 in turn will be strengthened).

Moderating Hypotheses: Moderating Effect of Sex

Hypothesis MODEFF4. Marriage protection effects will be stronger for men resulting in less depression over time for those with high marital quality as men need marriage for expressive functioning more than women do. (MPP1 will be negative and stronger for males than for females).

Hypothesis MODEFF5. Relationship commitment effects will be weaker for women resulting in less weight gain regardless of high marital quality as weight loss has a stronger impact on relationship marketability for women than for men. (RCP1 will be positive and weaker for females than for males).

Conclusion

The goal of this review is to outline the paradox that on the one hand, marriage is generally related to positive health outcomes while on the other, it is also related to weight gain and overweight/obesity, which are known to have negative health consequences. My aim for this study is to bring together perspectives from somewhat disparate literatures such as health benefits of marriage, mate selection and commitment, social facilitation of eating and exercise, marital quality, and life course theory in an effort to help explain this paradox. Selection, causal processes, and conditional processes are theoretically outlined. As the focus of this study is to examine the conditional process of marital quality, I propose a model examining the impact of marital quality, and depression on weight gain. This model is moderated by barriers to leaving, sex and age and shows how marital protection, relationship commitment and psychological stress hypotheses work together to explain the links between marital quality and weight. Given the prevalence of both overweight/obesity and marriage in the United States, gaining a greater understanding of the impact of the quality of one's marriage on weight is a vital component of the public health agenda in the United States.

CHAPTER TWO: METHOD

Data

The data used for this study is from the American's Changing Lives survey (House, 2010), a national four-wave panel survey of individuals in the United States (excluding Alaska and Hawaii), consisting of a multi-stage, stratified area probability sample of 3,617 individuals aged 25 and older in 1986 (Wave I). The original sample includes an over sampling of individuals over 60 years of age as well as an over sampling of African American individuals. Follow-up interviews were conducted in 1989 (N = 2,867), 1994 (N = 2,562 with primary respondent plus 164 by proxy) and 2002 (N = 1,693 with primary respondent plus 95 by proxy).

The survey covers a range of sociological, psychological, and health topics such as interpersonal relationships with spouse, children, parents, and friends; social interactions and leisure activities; health behaviors and utilization of health care services; physical health and psychological well-being; and many demographic characteristics such as employment status, income, financial situation, religious beliefs and practices, race, sex, and education.

The American's Changing Lives survey (ACL) was chosen for this study for a number of reasons. First, this data set is representative of the American population and includes the entire adult age range. Second, this data set is one of the only data sets that includes measures of marital quality (in addition to marital status) *and* measures of health status and health behaviors. Finally, the multiple waves of the ACL survey allows for both concurrent and longitudinal analyses of phenomena.

For the entire survey, the mean age of the participants was 53.64 (24-96) in Wave I, 55.64 (27-98) in Wave II, 58.51 (31-97) in Wave III, and 57.75 (25-99) in Wave IV[1]. At Wave I the sample was mostly White (64%), or African American (33%) and under-representative of Hispanics (1%), and Asians (1%). Mean years of education at Wave 1 was 11.5 (*SD* = 3.47) and was not assessed at subsequent waves. Median family incomes were $17,210 in Wave I, $19,500 in Wave II, $24,100 in Wave III, and $36,000 in Wave IV[2]. Body Mass Index (BMI) scores showed good variability at each wave, ranging from 11.5 to 55.1 (*M* = 26.02; *SD* = 5.10) in Wave I, 13.81 to 54.91 (*M* = 26.30; *SD* = 5.22) in Wave II, 14.17 to 54.68 (*M* = 26.70; *SD* = 5.36) in Wave III and 16.14 to 57.56 (*M* = 27.51, *SD* = 5.68) in Wave IV.

Sample

In order to avoid confounding the effects of changes in marital quality with the effects of marital parity and duration, I intended to constrain the analysis sample to include only individuals in early adulthood who were in their first marriages at Wave I and who were in the early stages of their marriage. Due to the loss of cases when the sample was restricted in this manner, however, the final analysis sample is limited to individuals aged 24-44 at Wave I who are continuously married over the first three waves of data collection (see Appendix A). Number of marriages and marital duration are included as control variables in the analyses. Wave IV data is not used as the

[1] Wave IV age data may be inaccurate as the lower end of the age range appears to be too young. There is a note in the codebook (at Wave II) that the age data does not match and Wave I age data should be used in analyses. These figures are based on self-reported age at each wave.

[2]Based on exact income cleaned and imputed by ACL staff. In Wave II 236 cases were imputed; in Wave III 209 cases were imputed; in Wave IV 165 cases were imputed. Where only bracketed income values were given, midpoint values were used to assign an actual dollar amount.

requirement for continuous marriages resulted in a dramatic drop in sample size. Due to over sampling of African Americans and the elderly, the data were weighted in accordance with the ACL guidelines (see Appendix A-2 for ACL sample design and weight information).

For this analysis sample, the average age of the participants was 34.58 (25-44 years) (*SD* = 5.38) in Wave I, 37.58 (28-47 years) in Wave II, and 42.98 (33-52 years) in Wave III[3]. The analysis sample is 53.1% female (compared to 62.5% in the full sample) and is somewhat more White (72.9% vs. 64%) and Hispanic (5.6% vs. 1%) than the full sample and somewhat less African American (18.1% vs. 33%). The analysis sample also has a higher mean level of education (13.48 years vs. 11.5 years) at Wave I than the full sample and a higher median family income at all three waves: $33,450 vs. $17,210 in Wave I, $44,000 vs. $19,500 in Wave II, and $52,000 vs. $24,100 in Wave III. As was true for the full sample, the Body Mass Index (BMI) scores in the analysis sample have good variability, ranging from 16.14 to 51.49 (*M* = 25.58) in Wave I, 16.14 to 46.87 (*M* = 26.30) in Wave II, and 16.64 to 51.54 (*M* = 27.12) in Wave III.

Concepts and Measures

As with all secondary data sources, there are some limitations to the use of this survey. Some compromise had to be made in terms of measurement. One must accept measures as designed and fit them into the current study. In addition, measures are subject to self-report bias as they are based on self-report rather than observational data. Finally, as the survey spans eight years between Wave I and Wave III, there is some

[3] These figures are from created age variables based on Wave I age.

response attrition due to both death and non-response. For a number of the measures, the staff of the American's Changing Lives survey imputed some data to decrease level of missingness. In addition, ipsative mean substitution was used in creating indices where there was missing data in individual items to decrease the level of missingness in the indices. Data management was conducted using SPSS statistical software version 20.

Sample Selection Measures

In addition to age, three measures were used for sample selection (see Appendix A). To determine an individual's marital status, participants were asked: "Are you currently married, separated, divorced, widowed or have you never been married?" Response categories include (1) "married", (2) "separated", (3) "divorced/marriage annulled", (4) "widowed", and (5) "never married". Only those cases with a score of "1-married" at all three waves were eligible for the analysis sample. In addition, cases were further excluded if they did not remain continuously married during the entire period between Wave I and Wave III. This criterion was determined by a negative response to the question "Have you gotten a divorce since (month of interview, 1989 or 1986)?" and a score of "0" on a flag dummy variable for marital status corrections (created in 1990 after Wave II) where "0" indicated that no marital status correction changes were made by ACL staff to either Wave I or Wave II data. The final sample size for this analysis is 465.

Dependent Variable: Body Mass Index

Body Mass Index (BMI) is commonly used to determine weight status in a population. It is calculated as weight in kilograms divided by the square of height in

meters (kg/m^2) (Bray, 1978). Some have recommended the use of waist circumference or waist-to-hip ratio measures (Janssen, Katzmarzyk, & Ross, 2004; Price, Uauy, Breeze, Bulpitt & Fletcher, 2006), especially for elderly populations as BMI may underestimate body fat in those who have lost muscle mass (Visscher & Seidell, 2001). However, BMI is generally considered a reliable measure of weight status at the population level (Kannel, 1983). In this study, respondents were asked to indicate their height (in inches) and weight (in pounds) (see Appendix B). From these two questions a continuous BMI measure was created[4]. Mean BMI scores at each wave all fall within the "overweight" category (Wave I = 25.58; Wave II = 26.30; and Wave III = 27.12), with standard deviations of 4.83, 4.96 and 5.31, respectively. The distributions on BMI at each wave were somewhat positively skewed but did not vary substantially from normality.

Table 1: Descriptives for BMI Waves I - III

	Wave 1	Wave II	Wave III
Mean	25.58	26.30	27.12
Standard Deviation	4.83	4.96	5.31
Skewness	1.39	1.17	1.30
Kurtosis	3.22	1.81	2.50
Range	35.35	30.73	34.90
Minimum	16.14	16.14	16.64
Maximum	51.49	46.87	54.54
N	465	465	465

Using cutoff points defined by the US Department of Agriculture (1995), World Health Organization (2006), and US Department of Health and Human Services (2005)

[4] As per the ACL codebook "median body mass index scores for males and females were used to impute values for 79 cases with missing data on this variable [for Wave I]" (House, 2006, p. 318). Fifty-five cases were imputed for Wave II and for Wave III, 25 cases were imputed for weight and 19 cases were imputed for height before the BMI calculation was performed.

BMI scores can be used to identify four categories: (1) "underweight" defined as BMI < 18.5; (2) "normal weight" as BMI 18.5-24.99; (3) "overweight" as BMI 25-29.99; and (4) "obese" as BMI ≥ 30. At Wave I, 1.5% of this analysis sample was underweight, 51.2% were normal weight, 32.5% were overweight, and 14.8% were obese. At Wave II, 0.6% of the sample was underweight, 44.3% were normal weight, 36.8% were overweight, and 18.3% were obese. At Wave 3, 0.9% of the sample was underweight, 37.8% were normal weight, 38.5% were overweight, and 22.8% were obese.

Independent Variable: Marital Quality

Marital quality is defined by Lewis and Spanier (1979) as "a subjective evaluation of a couple's relationship ... [where] the range of evaluations constitutes a continuum reflecting numerous characteristics of marital interaction and marital functioning" (p. 269). Lewis and Spanier argue that marital quality can be used to "encompass the entire range of terms (i.e., marital 'satisfaction', 'happiness', 'role strain and conflict', 'communication', 'integration', 'adjustment', etc...) ... [used as] dependent variables in marriage research" (1979, p. 269). Their argument is that all of these concepts "represent qualitative dimensions and evaluations of the marital relationship ... [and empirically] are highly intercorrelated" (Lewis & Spanier, 1979, p. 269).

Fincham and Bradbury (1987) indicate that a serious problem with marital quality measures occurs when such a wide variety of items are used in the measure of marital quality. Often items measuring marital quality overlap with items used as measures for independent variables, such as barriers to leaving. Fincham and Bradbury, therefore, suggest measuring marital quality solely as a global evaluation of one's marriage to avoid

confounding. Additional support for the use of a global measure of marital happiness is found in Goodwin (1992) who found that Item 31 ("happiness in the marriage") of the Dyadic Adjustment Scale developed by Spanier (1976), highly correlates with total adjustment scores on this scale and using only this single item differentiates as effectively as the entire scale between "distressed" and "non distressed" couples.

More recently, however, separate dimensions for positive and negative quality have been proposed by Fincham, Beach, and Kemp-Fincham (1997). They believe interpreting responses in the middle of the traditional bipolar scale (negative to positive) is unclear. Does the midpoint mean an absence of both or a presence of both? Two separate dimensions allow distinction between indifference (caring about nether satisfaction or dissatisfaction in the marriage) and ambivalence (caring about both satisfaction and dissatisfaction). Empirically, separate dimensions for positive and negative marital quality have been established through an examination of correlations and factor analyses (Fincham et al., 1997; Fincham & Linfield, 1997; Gable et al., 2003; Huston & Vangelisti, 1991).

The ACL survey included marital quality items that relate to a positive spouse support index, marital satisfaction index, spouse negative hassles index, negative spouse behavior index, and marital harmony index. However, most of the items used in these indices were not assessed at Wave III. In order to keep the measure of marital quality consistent across waves (so the meaning of the measure does not change from wave to wave), only items that were available at all waves are included in this analysis. The five marital quality scale items include two measures of support, one of satisfaction and two

that assess marital disharmony (see Appendix C). The two items measuring support asked: (1) "How much does your (husband/wife/partner) make you feel loved and cared for?" and (2) "How much is (he/she) willing to listen when you need to talk about your worries or problems?" For these two items, the response categories were: (1) "a great deal". (2) "quite a bit", (3) "some", (4) "a little", and (5) "not at all". The item measuring marital satisfaction asked: "Taking all things together, how satisfied are you with your (marriage/relationship)?" Here the response categories were (1) "completely satisfied", (2) "very satisfied", (3) "somewhat satisfied", (4) "not very satisfied", and (5) "not at all satisfied". Finally, the two items measuring marital disharmony asked: (1) "How often would you say the two of you typically have unpleasant disagreements or conflicts?" and (2) "Taking everything into consideration, how often do you feel bothered or upset by your marriage/relationship?" Response categories for the first of these were: (1) "daily or almost daily", (2) "2 or 3 times a week", (3) "about once a week", (4) "2 or 3 times a month", (5) "about once a month", (6) "less than once a month", and (7) "never". Response categories for the second question were: (1) "almost always", (2) "often", (3) "sometimes", (4) "rarely", and "never".

Factor analyses of these five items resulted in a one factor solution at each wave of data collection. The initial Eigenvalues show that this factor explained 59.26% of the variance at Wave I (Eigenvalue = 2.86), 59.54% at Wave II (Eigenvalue = 2.98) and 60.41% at Wave III (Eigenvalue = 3.02). All items had primary loadings over .5. A factor loading matrix is provided in Table 2.

Table 2: Marital Quality Factor Loadings for Waves I-III based on Principle Component Analysis.

Item	Wave I	Wave II	Wave III
Love and cared for by spouse	0.82	0.82	0.86
Spouse is willing to listen	0.75	0.71	0.78
Satisfaction with marriage	0.83	0.87	0.84
Frequency of unpleasant disagreements	-0.62	-0.63	-0.54
Bothered by marriage	-0.81	-0.82	-0.83
N	462	463	462

Since there were too few items to distinguish between positive and negative dimensions of marital quality and the items available at all three waves loaded consistently on a single factor, I constructed a single measure of marital quality that combines the three positive items and the two negative items into a single additive scale after reverse coding the three positive items ('feeling loved and cared for', 'willing to listen' and 'how satisfied') so that high scores indicate high levels of marital quality (see Appendix C-2 for correlations). To create equivalent units for response categories, each item was divided by its maximum possible score to give a range of 0 to 1 as possible values. Finally items were added together using ipsative mean substitution (within person mean substitution) to try to fill in for some missing data. Descriptives are shown in Table 3. Alpha is .81, .81, and .82 Waves I to III respectively.

Table 3: Descriptives for Marital Quality Indices Waves I – III

	Wave I	Wave II	Wave III
Mean	0.81	0.80	0.79
Standard Deviation	0.13	0.13	0.14
Skewness	-1.22	-0.87	-1.00
Kurtosis	1.77	0.45	1.20
N	465	465	462

Mediating Variable: Depression

Depression is assessed by a short version (11 items) of the Center for Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977) (see Appendix D). This shortened scale includes the following items: (1) "In the past week, I felt depressed", (2) "In the past week, I felt that everything I did was an effort", (3) "In the past week, my sleep was restless", (4) "In the past week, I was happy", (5) "In the past week, I felt lonely", (6) "In the past week, people were unfriendly", (7) "In the past week, I enjoyed life", (8) "In the past week, I did not feel like eating. My appetite was poor", (9) "In the past week, I felt sad", (10) "In the past week, I felt that people disliked me", and (11) "In the past week, I could not get 'going'". Response categories include: (1) "hardly ever", (2) "some of the time", and (3) "most of the time".

Final scale scores were created by the ACL staff. Item 4 ('I was happy') and Item 7 ('I enjoyed life') were reverse coded so that high values indicate high levels of depression. At Wave I, this scale was based on the mean of the eleven items and was converted to a standard score (House, 2003). Details about the construction of this scale were not included in the codebook for Wave II. At Wave III the index was standardized using Wave I means and standard deviations and one case was imputed (by ACL staff).

The Conrbach's Alpha for this scale at Wave I was reported as .83 for the entire ACL sample. Unfortunately, reliabilities for Wave II and Wave III were not provided in the ACL codebook[5]. Table 4 provides descriptive statistics for the depression scales.

Table 4: Descriptives for Depression Scales Waves I – III

	Wave I	Wave II	Wave III
Mean	3.93	3.79	3.67
Standard Deviation	0.94	0.91	0.90
Skewness	1.26	1.34	1.93
Kurtosis	1.88	1.77	4.90
N	465	465	462

Moderating Variable: Barriers to Leaving

Lewis and Spanier (1979) state that *extradyadic* factors affect the stability of marriage by acting as moderating variables. "The strength of the alternate attractions for the individual *outside* the marriage are balanced against the *external* pressures [barriers] to determine whether or not the marital dyad will have high or low marital stability" (Lewis & Spanier, 1979, p. 287, emphasis added). Barriers are described as push factors keeping an individual in a relationship. Examples of barriers they provide include: "strict divorce laws, strong social stigma, strict adherence to or influence from restrictive religious doctrine, low evaluation of nonmarital alternatives, high degree of commitment to marriage, and high tolerance for marital conflict and tension" (Lewis & Spanier, 1979, p. 287). However, if barriers are *extradyadic* factors then commitment to marriage and

[5] Sample reliabilities based on the individual items (not the ACL created indices) are 0.82 (*N* = 459), 0.81 (*N* = 460), and 0.83 (*N* = 462) Waves I to III respectively.

tolerance for conflict are not appropriate measures of barriers since these are not based on external forces.

Consistent with Lewis and Spanier, Levinger (1965, 1976) also views alternatives and barriers as forces *outside* the marital relationship. Levinger refers to barriers as restraining forces. "Barriers lessen the effect of temporary fluctuations in interpersonal attraction; even if attraction becomes negative, barriers act to continue the relationship" (Levinger, 1976, p. 26). "Barriers ... cannot theoretically be less than zero; they affect the relationship only insofar as either member contemplates its termination" (Levinger, 1976, p. 29).

Examples of barriers provided by Levinger include: financial expenses, obligation towards the marital bond, religious constraints, social pressures, obligation to dependent children, joint church attendance (as this leads to connected affiliations), and primary group affiliation. These measures all work within the extradyadic definition of barriers.

More recent work on barriers has examined both extradyadic factors such as financial barriers (home ownership, joint assets, and family income) (Booth, Johnson, White, & Edwards, 1985; Heaton & Albrecht, 1991; Knoester & Booth, 2000; Previti & Amato, 2003; White & Booth, 1991), social integration (Booth et al., 1985; White & Booth 1991), disapproval by family and friends (Knoester & Booth, 2000), wife's education (South & Spitze, 1986), wife's unemployment (White & Booth, 1991), presence of young children (including concern about children's suffering and concern about losing the children) (Heaton & Albrecht, 1991; Knoester & Booth, 2000; Previti &

Amato, 2003; White & Booth, 1991), as well as internal, psychological factors including: religious commitment (Booth, White, & Edwards, 1985; Heaton & Albrecht, 1991; Knoester & Booth, 2000; Previti & Amato, 2003), attitude towards divorce (Booth et al., 1985; Heaton & Albrecht, 1991; Previti & Amato, 2003), traditional values (Booth et al., 1985; Previti & Amato, 2003; White & Booth, 1991), psychological/emotional dependency (Knoester & Booth, 2000), and prior marriage (Heaton & Albrecht, 1991).

Given the lack of psychological barrier measures available in the ACL dataset (only religiosity and perceived likelihood of job loss), a distinction between the two types of barriers will not be made in this analysis. Knoester and Booth (2000) also found that objective measures of barriers were more effective than perceived barriers at preventing subsequent divorce: "objective circumstances appear to deter subsequent divorce slightly more effectively than do perceived barriers" (p, 95). In this study, the majority of the barriers are measured objectively although both objective and subjective barriers (where available) are assessed to determine if they moderate the relationship between marital quality and depression (and subsequently weight). Available barriers include an informal social integration index, a formal social integration index, number of children living in the household, employment status (an inverse barrier), income (an inverse barrier), education (an inverse barrier), spouse living in the household, time demands, religiosity, perceived likelihood of job loss, marital duration (as a proxy for investment), and spouse's health.

White (1990) states that social "integration increases the likelihood that people will follow social norms in choosing an appropriate spouse and fulfilling their marital

roles, and decreases the likelihood that they will court community stigma by divorcing" (White, 1990, p. 905). In this way, social integration is seen as a barrier. Increased involvement with family, kin and friends reinforces the marriage by increasing the joint support network of the couple and by providing an arena for strong social sanctions against marital dissolution. Two possible measures of social integration assessed in the ACL are an 'informal social integration index' and a 'formal social integration index'. The informal social integration index consisted of two items: "In a typical week, about how many times do you talk on the telephone with friends, neighbors or relatives?" and "How often do you get together with friends, neighbors or relatives and do things like go out together or visit in each other's homes". The formal social integration index also consisted of two items: (1) "How often do you attend meetings or programs of groups, clubs or organizations that you belong to?" and (2) "How often do you usually attend religious services?" Unfortunately, all four of these items are specific to individual networks rather than couple networks and there is no way of knowing whether the individual did these things alone (creating alternate sources of life satisfaction that might increase motivations for leaving) or with their spouse (creating a barrier to leaving their marriage through shared networks). As a result, neither of these measures could be used in this analysis.

As suggested by Lewis and Spanier (1979), adherence to or influence from religious doctrine is believed to keep a couple in a relationship thereby acting as a barrier to dissolution. Belonging to a religious organization can lead to negative sanctions if one chooses to get divorced. Supporting this assertion, Previti and Amato (2003) found that

religious beliefs were one of the most frequently mentioned barriers to leaving (along with children) and religion was found to be a significant barrier by Booth et al. (1985), Knoester and Booth (2000), and White and Booth (1991). Religious participation was measured by the following item: "How often do you usually attend religious services?" Response categories included: (1) "more than once a week", (2) "once a week", (3) "2 or 3 times a month", (4) "about once a month", (5) "less than once a month" and (6) "never". Participants' religiosity was measured by: "In general, how important are religious or spiritual beliefs in your day-to-day life?" Response categories included: (1) "very important", (2) "fairly important", (3) "not too important", and (4) "not at all important". Both items were reverse coded so that high values equal high barriers. Table 5 provides the descriptives for both religious participation and religiosity.

Table 5: Descriptive Statistics for Religious Participation and Religiosity

	Religious Participation			Religiosity		
	Wave I	Wave II	Wave III	Wave I	Wave II	Wave III
Mean	3.56	3.58	3.67	3.29	3.35	3.42
Standard Deviation	1.74	1.77	1.72	0.80	0.81	0.81
Skewness	-0.09	-0.16	-0.20	-0.88	-1.12	-1.30
Kurtosis	-1.44	-1.50	-1.33	0.02	0.58	0.95
N	465	465	462	465	465	462

The presence of dependent children in the household has also been found to prevent or delay dissolution (Heaton & Albrecht, 1991; White, Booth, & Edwards 1986) and thus is seen as a barrier to leaving. Number of children in the household is determined by the following request: "I need the age, sex and relationship to you of

everyone age 17 or younger who lives here". Descriptive statistics are provided in Table 6 for number of children in the household.

Table 6: Descriptive Statistics for Number of Children in the Household

	Wave I	Wave II	Wave III
Mean	1.86	1.95	1.79
Standard Deviation	1.21	1.16	1.23
Skewness	.581	.691	.691
Kurtosis	1.23	2.00	1.59
N	465	465	465

Another household characteristic that acts as a barrier to dissolution is the level of irretrievable investments made in one's marriage. Johnson (1985) defines irretrievable investments as "resources which an individual has put into a relationship which are perceived as 'lost' if the relationship ends" (p. 4). Marital duration could be used as a proxy for investment in the relationship. Each year of marriage represents an additional increment of emotional, psychological, social and economic investments that can never be retrieved should the marriage fail. To assess marital duration, year of interview was subtracted from reported year married. The means and standard deviations for number of years married at each wave were: 11.92 (SD = 6.52) in Wave I, 14.15 (SD = 6.85) in Wave II, and 19.06 (SD = 6.84) in Wave III. This variable was normally distributed at all three waves. Number of responses was 376 in wave 1, 465 in wave 2 and 464 in wave 3 for this measure indicating 19% missing in wave 1.

Two other barriers associated with the respondent's household were also considered but not included, one because it's measure lacked variability and the other

because it lacked information for all three waves. One's spouse living in the household is a barrier to dissolution insofar as close proximity and the high interdependence that comes with a shared household increases the likelihood and effectiveness of pressure from the spouse to stay in the marriage. Although questions were asked that allowed for the construction of a measure for this variable, there was no variability in this measure for the analysis sample so it was not included as a structural barrier in this analysis. Being in a position of responsibility for giving care to a friend, relative or family member can also be considered to be a barrier insofar as dissolving one's marriage puts those caregiving responsibilities at risk and a failure to fulfill these obligations can result in negative sanctions from others. Three questions were asked on the questionnaire to assess caregiving responsibilities and time spent in caregiving. Unfortunately, these questions were only asked in Wave I and Wave II and could therefore not be used in this three wave longitudinal analysis.

In addition, poor health of a spouse may make someone feel that they cannot leave their spouse (as it would be unfair/unjust) and could lead to negative sanctions from others should they choose to leave. Spouse's health was determined by the following question: "I would like to ask you about your (husband/wife/partner's) health. How would you rate your (spouse's/partner's) health at the present time". Once again this variable was only measured at Waves I and II and thus could not be included in the barrier index.

Respondent's employment status, income and education are used as inverse measures of barriers insofar as individuals who are employed, have adequate to good

incomes, and are educated, have the ability to leave a marriage and make it on their own (Knoester & Booth, 2000; White & Booth, 1991). Respondent's employment status was determined through the following question: "We would like to know about what you do. Are you working now for pay, looking for work, retired from a paid job, keeping house, a student or something else?" Response categories included: (1) "working now", (2) "only temporarily laid off; sick or maternity leave", (3) "unpaid family worker", (4) "looking for work: unemployed", (5) "retired from a paid job", (6) "permanently disabled", (7) "keeping house", (8) "student" and (9) "other (specify)". Dummy variables were created for employment status where 1 = "working now" and 0 = "other". This variable was then reverse coded at all three waves so that a high value indicates a lack of employment and, therefore, a high barrier to dissolution. The percentages unemployed at each wave were: 21.3%, 15.3%, and 13.5%, respectively.

Lack of finances or financial dependency can also act as a barrier to leaving. Knoester and Booth (2000) found that dependence on spouse decreased the likelihood of divorce while financial security and wife's income increased divorce. The ACL included a question to measure the perceived likelihood of losing one's job, but only included it in Wave I and Wave II. As a result, this barrier was not included in this analysis.

Several questions however, were asked in the ACL codebook that relate to respondent's income. The first available measure asked: "How much do you earn now from this job?" Responses were coded in dollars per time period stated (hour, day, week, bi-weekly, month, year, other (piecework/by job)). Twenty-two percent of the data was missing for this question at Wave I, 3% was missing in Wave II and 18% was missing in

Wave III. Another measure asked: "If we include the income from all of these sources, and add all of your (and your spouse's) earnings, what would your total income before taxes for the last 12 months add up to? How much of this total did YOU YOURSELF receive?" Response items included: "less than $5", "$5, - 9, 999", "$10, -14,999", "$15, -19,999", "$20, - 24,999", "$25, - 29,999", "$30, -39,999", "$40, - 59,999", "$60, - 79,999", "$80, +", "all", and "nothing". Unfortunately, the second half of this question 'how much of this total did you yourself receive' was only asked in Wave I. The remaining waves only assessed family income. Since a measure of family income makes it impossible to know if the individual has enough of their own income to be able to leave the relationship (an inverse barrier), an income variable was created based on only the first item "How much do you earn now from this job?" Responses were converted to dollars per year. In Wave II there were three values listed that seemed to be coding errors ($1,456,000, $41,600,000, and $99,840,000 per year) so these were removed. Transformations were attempted as this item was skewed and kurtotic but these did not improve the skew. Thus, to improve the skew, outliers were removed (high values of $124000 and $250000 per year in Wave I; $155000 and $500000 per year in Wave II; and $160000, $175000, $200000 and $216000 per year in Wave III). Descriptive statistics are provided in Table 7 below for the income variable with outliers, and without outliers. Finally, income was reverse coded by multiplying by -1 so that low income indicates high barriers.

Table 7: Descriptive Statistics for Income – With Outliers and Without Outliers, (before reverse coding)

	Income (Dollars/Year)					
	With Outliers			Without Outliers		
	Wave I	Wave II	Wave III	Wave I	Wave II	Wave III
Mean	23,454.89	23,812.56	33,292.80	22,544.08	22,450.73	31,658.33
Standard Deviation	19542.54	29468.67	24985.56	14547.75	17950.25	19238.23
Skewness	5.49	9.95	3.04	2.04	1.41	1.15
Kurtosis	52.96	153.35	15.94	7.57	3.81	1.75
Minimum	0	0	2000.00	0	0	2000.00
Maximum	250,000.00	500,000.00	216,000.00	104,000.00	115,000.00	106,000.00
N	362	448	382	360	446	378

Education level of the participants' was determined by the following question: (1) "What is the highest grade of school or year of college you have completed?" Responses were coded in number of years. Although level of education was only assessed at Wave I, since all respondents were 25 years old and older this measure will be used as a time invariant measure in subsequent waves.

In addition to employment status, the number of hours worked per year can also act as a barrier to dissolution, but in the opposite manner. While employment status is an inverse barrier, the hours worked at one's job is a direct barrier insofar as hours spent at work make it more difficult to pursue dissolution options that may provide an outlet to escape a poor quality marriage without divorcing. Two questions were used to assess the number of hours worked per year: (1) "Including paid vacation and sick leave, how many weeks altogether were you employed during the past 12 months?" and (2) "On the average, how many hours a week do you work on this job, including paid and unpaid

overtime?" Question 1 (weeks of employment) was coded in number of weeks and question 2 (hours a week you work at main job) was coded in number of hours. These two variables were multiplied together to get the number of hours worked per year. The mean number of hours worked per year for Wave I through Wave III were 1709 (SD = 1096), 1819 (SD = 1046), and 1903 (SD = 954), respectively. Measures of skew and kurtosis for these measures were within acceptable parameters of normality. . There were no missing cases on this variable in Wave I and Wave II and only 13% were missing in Wave III.

Another irretrievable investment made in marriage in the form of a socioeconomic barrier is level of assets. These assets would be 'lost' or at least significantly reduced should the marriage end, thus assets act as a barrier to leaving. There were two questions that could be used to assess financial assets. The first question was: "If you sold this (house/apartment/farm) today, how much money would you get for it (after paying off the mortgage)?" The responses were coded in dollars. The second question asked: "Suppose you needed money quickly, and you cashed in all of your (and your spouse's) checking and savings accounts, and any stocks and bonds, and real estate (other than your principal home). If you added up what you got, about how much would this amount to? Just give me the letter from the list." Response categories included: (a) "less than $10, 000", (b) "$10,000 - $19,999", (c) "$20,000 - $49,999", (d) "$50,000 - $99,999", (e) "$100,000 - $199,999", (f) "$200,000 - $499,999", and (g) "$500,000 or more". Responses to these questions were combined by placing the items on a zero to one scale and then using Ipsative mean substitution. Finally the assets variables were

reverse coded by multiplying by -1 so that high levels of assets indicated a strong barrier. Descriptives are provided in Table 8 below.

Table 8: Descriptive Statistics for Assets

	Wave I	Wave II	Wave III
Mean	0.88	0.85	0.77
Standard Deviation	0.17	0.18	0.19
Skewness	-2.10	-1.77	-0.96
Kurtosis	5.87	4.32	1.39
N	457	458	458

Appendix E lists the barrier measures that were available at all three waves of data collection. Table 9 provides correlation coefficients for the effects of these nine measures of barriers on BMI and Depression. Appendix E-2 has standardized regression coefficients using weighted data. It was decided that potential barrier measures that were significant at a lenient $p < .15$ at any wave would be included in the construction of the barrier indices. The final barrier indices included: religious participation, religiosity, number of children in the household, marital duration, employment status, income, education, hours worked per year, and assets.

Table 9: Correlations between Barrier Items and Depression and BMI

Wave I											
	1	2	3	4	5	6	7	8	9	10	11
1. BMI	1.0										
2. Depression	.03 (n=465)	1.0									
3. Religious Participation[r]	.05 (n=465)	-.15** (n=465)	1.0								
4. Religiosity[r]	.07[t] (n=465)	.08[t] (n=465)	.56** (n=465)	1.0							
5. Number of Children	.08[t] (n=465)	.08[t] (n=465)	.19** (n=465)	.22** (n=465)	1.0						
6. Marital Duration	.17** (n=376)	.04 (n=376)	.16** (n=376)	.20** (n=376)	.36** (n=376)	1.0					
7. Employment Status[r]	-.06 (n=465)	.18** (n=465)	.03 (n=465)	.15** (n=465)	.17** (n=465)	.05 (n=376)	1.0				
8. Income[r]	-.03 (n=360)	.12* (n=360)	.13* N=360)	.23** (n=360)	.14** (n=360)	.10t (n=293)	.14** (n=360)	1.0			
9. Education[r]	.16** (n=465)	.17** (n=465)	-.02 (n=465)	.14** (n=465)	.20** (n=465)	.25** (n=376)	.17** (n=465)	.33** (n=360)	1.0		
10. Hours Worked	-.14** (n=465)	.14** (n=465)	.09* (n=465)	.18** (n=465)	.18** (n=465)	.04 (n=376)	.77** (n=465)	.33** (n=360)	.19** (n=465)	1.0	
11. Assets	.05 (n=457)	.06 (n=457)	.07[t] (n=457)	.03 (n=457)	.04 (n=457)	-.13 (n=371)	.03 (n=457)	.29** (n=358)	.19** (n=457)	.03 (n=457)	1.0

Table 9: Correlations between Barrier Items and Depression and BMI, continued

Wave II											
	1	2	3	4	5	6	7	8	9	10	11
1. BMI	1.0										
2. Depression	.01 (n=465)	1.0									
3. Religious Participation[r]	.01 (n=465)	-.10* (n=465)	1.0								
4. Religiosity[r]	.04 (n=465)	.02 (n=465)	.58** (n=465)	1.0							
5. Number of Children	.02 (n=465)	.05 (n=465)	.15** (n=465)	.56** (n=465)	1.0						
6. Marital Duration	.12* (n=465)	.02 (n=465)	.09[t] (n=465)	.13** (n=465)	.09[t] (n=465)	1.0					
7. Employment Status[r]	-.01 (n=465)	.04 (n=465)	.07[t] (n=465)	.11* (n=465)	.14** (n=465)	.02 (n=465)	1.0				
8. Income[r]	-.02 (n=446)	.20** (n=446)	.12* (n=446)	.19** (n=446)	.15** (n=446)	.06 (n=446)	.48** (n=446)	1.0			
9. Education[r]	.18** (n=465)	.21** (n=465)	-.07[t] (n=465)	.13** (n=465)	.10* (n=465)	.19** (n=465)	.14** (n=465)	.40** (n=446)	1.0		
10. Hours Worked	-.12** (n=465)	.08 (n=465)	.14** (n=465)	.17** (n=465)	.18** (n=465)	.10* (n=465)	.68** (n=465)	.60** (n=446)	.23** (n=465)	1.0	
11. Assets	.05 (n=458)	.11* (n=458)	.06 (n=458)	.06 (n=458)	.11* (n=458)	-.08[t] (n=458)	.08[t] (n=458)	.26** (n=442)	.21** (=458)	.04 (n=458)	1.0

Table 9: Correlations between Barrier Items and Depression and BMI, continued

Wave III											
	1	2	3	4	5	6	7	8	9	10	11
1. BMI	1.0										
2. Depression	.10* (n=462)	1.0									
3. Religious Participation[r]	.06 (n=462)	-.01 (n=462)	1.0								
4. Religiosity[r]	.08[t] (n=462)	.10* (n=462)	.61** (n=462)	1.0							
5. Number of Children	-.03 (n=465)	-.01 (n=462)	.16** (n=462)	.16** (n=462)	1.0						
6. Marital Duration	.15** (n=464)	.01 (n=461)	.04 (n=461)	.06 (n=461)	-.23** (n=464)	1.0					
7. Employment Status[r]	-.01 (n=464)	.17** (n=461)	.01 (n=461)	.03 (n=461)	.08[t] (n=464)	.06 (n=463)	1.0				
8. Income[r]	.00 (n=378)	.18** (n=378)	.18** (n=378)	.15** (n=378)	-.03 (n=378)	.09[t] (n=377)	.18** (n=378)	1.0			
9. Education[r]	.16** (n=465)	.29** (n=462)	-.06 (n=462)	.07[t] (n=462)	-.06 (n=465)	.18** (n=464)	.23** (n=464)	.42** (n=378)	1.0		
10. Hours Worked	-.13* (n=404)	.69 (n=404)	.23** (n=404)	.21** (n=404)	.08t (n=404)	-.05 (n=403)	.22** (n=404)	.42** (n=376)	.13* (n=404)	1.0	
11. Assets	.15** (n=458)	.10* (n=455)	.10* (n=455)	.08[t] (n=455)	.13** (n=458)	-.09* (n=457)	.03 (n=457)	.27** (n=376)	.20** (n=458)	.10* (n=397)	1.0

[t] $p < .15$; * $p < .05$; ** $p < .01$.
[r] indicates items were reverse coded

Before creating the barrier indices, all variables were placed on a zero to one scale so that each of the measures contributed to the barrier index equally and ipsative mean substitution was used to reduce missing data. Descriptives for the barrier indices are provided in Table 10.

Table 10: Descriptive Statistics for Barrier Indices

Barrier Index			
	Wave I	Wave II	Wave III
Mean	0.53	0.51	0.51
Standard Deviation	0.13	0.12	0.11
Skewness	0.12	0.13	.09
Kurtosis	-0.38	-0.16	0.03
Minimum	0.11	0.14	0.24
Maximum	0.87	0.82	0.83
N	465	465	465

Demographic and Control Variables

Control variables considered included: age, sex, number of marriages, ethnicity, respondent's health, chronic conditions, functional health, physical activity, job physical demands, household physical demands, and financial chronic stress. Due to the large number of control variables, the possibility of multicolinearity occurring, and small sample size, control variables were included in the analysis only if they were measured at all three waves and had significant correlations on depression and/or BMI at the lenient $p < 0.15$ probability level.

Age and sex. Both of these variables were determined by the following question: "I need to list the people who live here – adults first, then people under 18. I don't need

names, just the age, sex and relationship to you for each person. Let's start with you. How old are you?" Age and sex will be used as moderators in the analyses. Heaton and Albrecht (1991) state that the "influence of age is greater for women" (p. 757) than for men as a woman's age may have a stronger impact on their ability to be successful at re-entering the marriage market than men's age. However, importance of re-entering the market may vary by gender as "social activity and the potential deterioration of sex life [were found to be] … important for men but not women" (Heaton & Albrecht, 1991, p. 757), thus, necessity of weight maintenance or loss for re-entry into the marriage market may be influenced by one's age and gender. Age was computed using Wave I self-reported age for Wave I, adding 3 years for Wave II, and adding 8 years for Wave III (reflecting the time span between waves). Although measures of self-reported age were available at all three waves, these did not match. As stated in footnote 2 above, the ACL codebook suggests using Wave I age data to compute age due to these inconsistencies. Computing year of interview minus birth year also did not match Wave I self-reported age as the ACL staff rounded age down. Thus, to avoid inconsistencies and to be consistent with the method used for sample selection, age calculations were based on Wave I self-reported age data. Descriptive statistics for age and sex are reported in Table 11 below. The sample is 53.1% female.

Table11: Descriptives for Age and Sex

	Age			Sex
	Wave I	Wave II	Wave III	
Mean	34.58	37.58	42.58	1.53
Standard Deviation	5.38	5.38	5.38	0.50
Skewness	0.04	0.04	0.04	-0.13
Kurtosis	-1.05	-1.05	-1.05	-1.99
N	465	465	465	465

Number of marriages. Number of marriages was only assessed at Waves I and II and thus was not included as a potential control variable. Only 1 person got divorced and remarried between waves I and II. In wave I, 377 of the 465 in the sample were in their first marriage, 81 were in their second, 6 in their third and 1 in their fourth marriage. In wave II, 376 were in their first marriage, 82 in their second, 6 in their third and 1 in their fourth marriage.

Minority status. Race/ethnicity was determined by two questions. The first asked: "Are you of Spanish or Hispanic descent, that is, Mexican, Mexican American, Chicano, Puerto Rican, Cuban or Spanish? Which one?" The second question asked: "Are you White, Black, American Indian, Asian, or another race?" Based on these two questions, ACL staff created a cleaned and imputed 5 category race variable: (1) White, (2) Black, (3) Native American, (4) Asian, and (5) Hispanic. In the Wave IV codebook, a new revised race/ethnicity variable was created based on the original race/ethnicity variable and the following four questions: (1) "In addition to being American, what do you think of as your ethnic background or origins?", (2) "In what state or foreign country were you born?", (3) " In what state or foreign country was your natural father born?"

and (4) “In what state of foreign country was your natural mother born?” (all of these were collected at Wave I). I chose to use this revised race/ethnicity variable for this analysis as the revision resulted in more minority status individuals (white: 77% to 72.9%; Black: 18.3% to 18.1%; Native American: 1.7% to 1.5%; Asian: 1.9% to 1.9%: and Hispanic: 1.1% to 5.6%). Race/ethnicity was recoded into minority status where 1 = white and 2 = non-white. Of the 465 participants, 399 (72.9%) where white and 126 (27.1%) were non-white.

Respondent’s health. Respondents’ current health was measured by three questions. The first question asked: “How would you rate your health at the present time?” Response categories included: (1) “excellent”, (2) “very good”, (3) “good”, (4) “fair”, and (5) “poor”. The second question asked: “In general, how satisfied are you with your health?” Response categories included: (1) “completely satisfied”, (2) “very satisfied”, (3) “somewhat satisfied”, (4) “not very satisfied”, and (5) “not at all satisfied”. The third question asked: “How much are your daily activities limited in any way by your health or health related problems?” Response categories included: (1) “a great deal”, (2) “quite a bit”, (3) “some”, (4) “a little”, and (5) “not at all”. The third question was reverse coded before creating an index for respondent’s health. Reliability analysis provided the following alpha coefficients for the three items: 0.75, 0.73, and 0.76 Waves I-III respectively. Ipsative mean substitution was used when creating the indices. Table 12 provides descriptive statistics for respondent’s health.

Table 12: Descriptive Statistics for Respondent's Health

	Wave I	Wave II	Wave III
Mean	5.46	5.66	6.12
Standard Deviation	1.98	1.91	2.23
Skewness	1.13	1.02	1.01
Kurtosis	1.81	1.80	1.40
N	465	465	462

Chronic conditions. Number of chronic conditions was assessed by the following 10 questions: (1) "Have you had arthritis or rheumatism during the last 12 months?", (2) "During the last 12 months, have you had a lung disease?", (3) "Have you had hypertension, sometimes called high blood pressure, or have you taken medication for it?", (4) "Have you had a heart attack or other heart trouble during the last 12 months?", (5) "Have you had diabetes or high blood sugar, or have you taken medication for it?", (6) "During the last 12 months, have you had cancer or a malignant tumor of any kind?", (7) "Have you had foot problems such as problems with circulation, corns or calluses?", (8) "Have you had a stroke during the last 12 months?", (9) "Have you had any broken or fractured bones?", and (10) "Have you lost any amount of urine beyond your control during the last 12 months?" Responses are coded "yes" or "no". Indices were created by ACL staff by adding up the number of "yes" responses to these items. Missing responses were imputed as "no" responses. Table 13 provides descriptive statistics for chronic conditions. The minimum number of chronic conditions reported at all waves was zero, the maximum number was 3, 4 and 7 for Waves I-III respectively.

Table 13: Descriptive Statistics for Chronic Conditions

	Wave I	Wave II	Wave III
Mean	0.34	0.39	0.57
Standard Deviation	0.61	0.70	0.91
Skewness	1.86	2.05	2.14
Kurtosis	3.27	4.46	6.96
N	465	465	465

Functional health. Participants' functional health was assessed by eight items. The first item asked: "Are you currently in bed or a chair for most of all of the day because of your health?" Responses were coded "yes" or "no". Three questions were asked about difficulty bathing: (1) "Do you currently have any difficulty bathing by yourself?", (2) "Does someone else help you bathe?", and (3) "How much difficulty do you have bathing by yourself?" Responses to the first two items were coded "yes" or "no". Response categories for the third item included: (1) "a little", (2) "some", (3) "a lot", and (4) "can't do this on own". Two items were asked to assess difficulty with stairs. The first item asked: "Do you currently have any difficulty climbing a few flights of stairs because of your health?" Response items were coded "yes", "age is only limitation", and "no". The second question asked: "How much difficulty do you have?" Response categories included: (1) "a little", (2) "some", (3) "a lot", and (4) "can't do this at all". Next, two questions asked about difficulty walking. The first item asked: "Do you currently have any difficulty walking several blocks because of your health?" Responses were coded "yes", "age is only limitation", and "no". The second item asked: "How much difficulty do you have?" Response categories included: (1) "a little", (2) "some", (3) "a lot", and (4) "can't do this at all". Finally, two questions asked about

difficulty doing work around the house. The first question asked: "Would you currently have any difficulty doing heavy work around the house such as shoveling snow or washing walls, because of your health?" Responses were coded "yes", "age is only limitation", and "no". The second item asked: "How much difficulty would you have?" Response categories included: (1) "a little", (2) "some", (3) "a lot", and (4) "can't do this at all".

Based on these questions the following Functional Health Index was created by ACL staff: (1) "Most severe functional impairment", (2) "Moderately severe functional impairment", (3) "Least severe functional impairment", and (4) "No functional impairment". The codebook at Wave II provided further information on this index: "A Gutman-type scale was formed with the following levels of functional impairment: (1) Most severe level = respondents who are currently in bed or chair and/or who have a lot of difficulty bathing or cannot bathe, (2) Moderately severe = respondents who have a lot of difficulty climbing stairs or cannot do it and/or have a lot of difficulty walking or cannot do it but were not in previously defined severity level, (3) Least severe level = respondents who have a lot of difficulty doing heavy housework or cannot do it but who are not in two previously defined severity levels, and (4) No functional impairment = respondents answered no to all of the functional impairment questions" (House, 2003, p.1049). At Wave III the codebook indicated that 19 cases were imputed by ACL staff for this variable. Functional health of this sample was very good at all waves. Mean functional health was 3.93 (SD = 0.38), 3.96 (SD = 0.28), and 3.84 (SD = 0.61) Waves I-III respectively (higher score indicating better health). In fact 95.9% of the sample

reported no functional disability at Wave I. The figures for Waves II and III are 97.2% and 92.7% respectively. On the other extreme, only 1.1%, 0.2% and 3.4% of the sample reported severe functional disability (Waves I-III respectively). These data were highly skewed (-6.33, -7.21, -3.96 Waves I-III respectively) and highly kurtotic (42.48, 56.24, 14.62 Waves I-III respectively). As data transformations did not help normalize these data, the untransformed indices were used in further analyses.

Physical activity. Three questions made up the physical activity index: (1) "How often do you work in the garden or yard?", (2) "How often do you engage in active sports or exercise?", and (3) "How often do you take walks?" Response categories included: (1) "often", (2) "sometimes", and (3) "never". ACL staff constructed this index by taking the arithmetic mean of the three items and then standardized the measure. High scores were equivalent to high activity. Three cases were imputed in Wave I. At Wave II, the codebook provided the following information about the construction of this index: the index was "constructed using the arithmetic mean of at least 2 of the three items used (standardized with ACL1 mean and sd). The index is then standardized based on ACL1 index weighted mean and sd (-.24/.6830)" (House, 2003, p. 1034). One case was imputed at Wave II (after this procedure). At Wave III, the index was standardized using Wave I means and standard deviations. Four cases were imputed at this wave by ACL staff. Mean physical activity was 0.24 (SD = 0.82), 0.06 (SD = 0.85), and 0.26 (SD = 0.80) for Waves I-III respectively. The data was not skewed (-0.55, -0.43, -0.38 Waves I-III respectively) nor kurtotic (0.05, -0.21, -0.30 Waves I-III respectively).

Two other indices asked about physical demands, a job physical demands index and a household physical demands index. As these items were only asked in Waves I and II, these variables were not included as control variables.

Financial chronic stress. The financial chronic stress index was comprised of three items. The first question asked: "How satisfied are you with your/your family's present financial situation?" Response categories included: (1) "completely", (2) "very", (3) "somewhat", (4) "not very", and (5) "not at all". The second question asked: "How difficult is it for you/your family to meet the monthly payments on your family's bills?" Response categories included: (1) "extremely difficult", (2) "very difficult", (3) "somewhat difficult", (4) "slightly difficult", and (5) "not difficult at all". The third question asked: "In general, how do your family's finances usually work out at the end of the month?" Response categories included: (1) "some money left over", (2) "just enough money to make ends meet", and (3) "not enough money to make ends meet". This index was created by ACL staff where a higher score indicates higher chronic financial stress. As stated in the codebook, the index was created in Wave I by taking the arithmetic mean of the three items. This was then standardized. Thirteen cases were imputed. At Wave II, the arithmetic mean of at least two of the three items was used in the creation of the index. This was then "standardized with ACL1 mean and sd. The index is then standardized based on ACL1 weighted mean and sd (.3/.8464)" (House, 2003, p. 1044). After this rule, cases were imputed by regression. In Wave III, the index was standardized using Wave I means and standard deviations. Ten cases were imputed. Mean financial chronic stress was 0.01 (SD = 0.88), -0.06 (SD = 0.83), and -0.02 (SD =

0.86) Waves I-III respectively. The indices were not skewed (0.87, 0.97, 0.74 Waves I-III respectively) nor kurtotic (0.47, 0.91, 0.59 Waves I-III respectively).

Due to the large number of control variables and small sample size, control variables were only included in the analysis if they were significant with depression and/or BMI at the lenient $p < 0.15$ probability at any wave (in addition to being measured at all three waves). Table 14 provides correlation coefficients between the control variables and BMI and Depression. Appendix F-2 presents standardized regression coefficients for the effects of control variables on BMI and depression using weighted data. Control variables included in the model for both depression and BMI include: age, sex, minority, respondent's health, chronic conditions, functional health, physical activity, and financial stress.

Table 14: Correlations between Control Variables and Depression and BMI

Wave I *n* = 465										
	1	2	3	4	5	6	7	8	9	10
1. BMI	1.0									
2. Depression	.03	1.0								
3. Age	.16**	.02	1.0							
4. Sex	-.18**	.14**	.04	1.0						
5. Minority Status	.12**	.16**	.10*	.02	1.0					
6. Respondent's Health	.20**	.31**	.09^{t}	.11*	.05	1.0				
7. Chronic Conditions	.22**	.20**	.22**	.09*	.07^{t}	.33**	1.0			
8. Functional Health	-.07^{t}	-.11*	-.09^{t}	-.07^{t}	-.06	-.43**	-.18**	1.0		
9. Physical Activity	-.05	-.21**	-.01	-.13**	-.04	-.21**	-.15**	.14**	1.0	
10. Financial Stress	.13**	.21**	.01	.04	.11*	.22**	.11*	-.06	-.08^{t}	1.0
Wave II *n* = 465										
	1	2	3	4	5	6	7	8	9	10
1. BMI	1.0									
2. Depression	.01	1.0								
3. Age	.14**	.03	1.0							
4. Sex	-.16**	.08^{t}	.04	1.0						
5. Minority Status	.11*	.11*	.10*	.02	1.0					

Table 14: Correlations between Control Variables and Depression and BMI, continued

6. Respondent's Health	.26**	.34**	.05	.08[t]	.03	1.0			
7. Chronic Conditions	.25**	.24**	.11*	.18**	.06	.39**	1.0		
8. Functional Health	.04	-.16**	.00	-.08[t]	.03	-.34**	-.18**	1.0	
9. Physical Activity	-.10*	-.20**	-.04	-.17**	-.18**	-.19**	-.12**	.12**	1.0
10. Financial Stress	.09[t]	.29**	-.00	.01	.11*	.17**	.14**	.03	-.08[t]	1.0
Wave III										
	1	2	3	4	5	6	7	8	9	10
1. BMI	1.0									
2. Depression	.10* (*n*=462)	1.0								
3. Age	.12** (*n*=465)	.08[t] (*n*=462)	1.0							
4. Sex	-.15** (*n*=465)	.09[t] (*n*=462)	.04 (*n*=465)	1.0						
5. Minority Status	.10* (*n*=465)	.20** (*n*=462)	.10* (*n*=465)	.02 (*n*=465)	1.0					
6. Respondent's Health	.27** (*n*=462)	.41** (*n*=462)	.11* (*n*=462)	.00 (*n*=462)	.10* (*n*=462)	1.0				
7. Chronic Conditions	.22** (*n*=465)	.24** (*n*=462)	.27** (*n*=465)	.05 (*n*=465)	.07[t] (*n*=465)	.47** (*n*=462)	1.0			
8. Functional Health	-.13** (*n*=465)	-.29** (*n*=462)	-.07[t] (*n*=465)	-.03 (*n*=465)	-.09* (*n*=465)	-.39** (*n*=462)	-.22** (*n*=465)	1.0		

Table 14: Correlations between Control Variables and Depression and BMI, continued

9. Physical Activity	-.09[t] (n=462)	-.12** (*n*=462)	.03 (*n*=462)	-.12* (*n*=462)	-.02 (*n*=462)	-.13** (*n*=462)	-.05 (*n*=462)	.06 (*n*=462)	1.0	
10. Financial Stress	.14** (*n*=462)	.29** (*n*=462)	-.05 (*n*=462)	-.08[t] (*n*=462)	.10* (*n*=462)	.26** (*n*=462)	.07[t] (*n*=462)	-.03 (*n*=462)	-.16** (*n*=462)	1.0

[t] $p < .15$; * $p < .05$; ** $p < .01$.

CHAPTER THREE: RESULTS

Descriptive Statistics and Bivariate Correlations

Table 15 below provides descriptive statistics for the variables used in the model testing. Means and standard deviations as well as minimum and maximum values are displayed. These numbers show several points of interest. BMI increased slightly over time. Marital quality (placed on a zero to one scale) and depression both decreased over time. Barriers (zero to one scale) also decreased slightly over time. For the control variables, respondent's health decreased over time (low number equals better health), chronic conditions increased, functional health worsened only in Wave III (large values indicate good functional health) and financial stress decreased in Wave II and then increased slightly in Wave III.

Table 15. Descriptive Statistics for Variables Used in Model Testing

Wave I					
	N	Mean	SD	Minimum	Maximum
BMI	465	25.58	4.83	16.14	51.49
Martial Quality	465	0.81	0.13	0.27	1.00
Depression	465	-0.07	0.94	-1.11	4.47
Barriers	465	0.53	0.13	0.11	0.87
Age	465	34.58	5.38	25.00	44.00
Sex	465	1.53	0.50	1.00	2.00
Minority Status	465	1.27	0.44	1.00	2.00
Respondent's Health	465	5.46	1.98	3.00	14.00
Chronic Conditions	465	0.34	0.61	0.00	3.00
Functional Health	465	3.93	0.38	1.00	4.00
Physical Activity	465	0.24	0.82	-2.36	1.50
Financial Chronic Stress	465	0.01	0.88	-1.27	2.79
Wave II					
BMI	465	26.30	5.00	16.14	46.87
Martial Quality	465	0.80	0.13	0.28	1.00
Depression	465	-0.21	0.91	-1.13	3.96
Barriers	465	0.51	0.12	0.14	0.82
Age	465	37.58	5.38	28.00	47.00
Respondent's Health	465	5.66	1.91	3.00	15.00
Chronic Conditions	465	0.39	0.70	0.00	4.00
Functional Health	465	3.96	0.28	1.00	4.00
Physical Activity	465	0.06	0.85	-2.36	1.50
Financial Chronic Stress	465	-0.06	0.83	-1.27	2.79
Wave III					
BMI	465	27.12	5.31	16.64	51.54
Martial Quality	462	0.79	0.14	0.19	1.00
Depression	462	-0.33	0.90	-1.11	4.14
Barriers	465	0.51	0.11	0.24	0.83
Age	465	42.58	5.38	33.00	52.00
Respondent's Health	462	6.12	2.23	3.00	15.00
Chronic Conditions	465	0.57	0.91	0.00	7.00
Functional Health	465	3.84	0.61	1.00	4.00
Physical Activity	462	0.26	0.80	-2.36	1.50
Financial Chronic Stress	462	-0.02	0.86	-1.37	2.72

Table 16 provides correlations between the variables used in the model analyses for Waves I – III and over time (excluding control variables over time). Once again these numbers show several points of interest. BMI is not related to any of the independent variables except for depression (r = .10, p. = .029) and barriers (r = .12, p = 011) at Wave III. BMI is however consistently related to several of the control variables. It is positively related to age, negatively related to sex, positively related to minority status, positively related to respondent's health and positively related to chronic conditions at all three waves. BMI is positively related to financial stress at Wave I and III and negatively related to physical activity at Wave II. Marital quality is negatively correlated with depression (r = -.34, p. = .000; r =- .41, p. = .000; r = -.43, p. = .000 Waves I-III respectively) at all three waves. In addition, marital quality is consistently related to several control variables. It is negatively related to sex, negatively related to respondent's health, positively related to physical activity, and negatively related to financial stress. It is negatively related to minority status and number of chronic conditions at Wave II. In addition to being negatively related to marital quality, depression is positively related to barriers at all three waves (r = .14, p. = .002; r = .10, p = .040; r = .20, p = .000 Waves I to III respectively) and is consistently related to several control variables. Depression is positively related to minority status, respondent's health, number of chronic conditions and financial stress and negatively related to functional health and physical activity at all three waves. Depression was also positively related to age at Wave I. Aside from being positively related to depression, barriers were also related to several control variables. Barriers were consistently positively related to age,

sex, minority status, respondent's health, chronic conditions, and financial stress at all waves. Barriers were also negatively related to functional health at Wave III.

BMI is highly correlated with itself over time (BMI Wave I to Wave II: r = .93, p. = .000; BMI Wave I to Wave III: r = .90, p. = .000; BMI Wave II to wave III: r = .91, p. =.000). Depression is moderately correlated with itself over time (DEP Wave I to Wave II: r = .45, p. = .000; DEP Wave I to Wave III: r = .50, p. = .000; DEP Wave II to Wave III: r = .47, p. = .000). Marital quality is also moderately correlated with itself (MQ Wave I to Wave III: r = ..66, p. = .000; MQ Wave I to Wave III: r = .59, p. = .000; MQ Wave II to Wave III: r = .65, p. = .000). Barriers are highly correlated with one another over time (BARS Wave I to Wave II: r = .80, p. = .000; BARS Wave I to Wave III: r = .75, p. = .000; BARS Wave II to Wave III: r = .79, p. = .000). BMI at all three waves is positively related to depression only at Wave III (BMI Wave I to DEP Wave III: r = -.11, p. = .025; BMI Wave II to DEP Wave III: r = .10, p. = .025; BMI Wave III to DEP Wave III: r = .10, p. = .029). BMI at Wave III is also positively related to barriers at Wave III (r = .12, p = 011). Marital quality at all three waves is negatively related to depression at all three waves (MQ Wave I to DEP Wave I: r = -.34, p. = .000; MQ Wave I to DEP Wave II: r = -.27, p. = .000; MQ Wave I to DEP Wave III: r = -.24, p. = 000; MQ Wave II to DEP Wave I: r = -.28, p. = .000; MQ Wave II to DEP Wave II: r = -.41, p. = .000; MQ Wave II to DEP Wave III: r = -.26, p. = .000; MQ Wave III to DEP Wave I: r = -.27, p. = 000; MQ Wave III to DEP Wave II: r = -.28, p. = .000; MQ Wave III to DEP Wave III: r = -.43, p. = .000). Marital quality at Wave I is also negatively related to barriers at Wave III (MQ Wave I to BARS Wave III: r = -.11, p. = .014). Barriers are also

positively correlated with depression at all three waves (BARS Wave I to DEP Wave I: *r* = .14, *p*. = .002; BARS Wave I to DEP Wave II: *r* = .14, *p*. = .003; BARS Wave I to DEP Wave III: *r* = .21, *p*. = .000; BARS wave II to DEP Wave I: *r* = .10, *p* = .037; BARS Wave II to DEP Wave II: *r* = .10, *p*. = .040; BARS Wave II to DEP Wave III: *r* = .18, *p*. = .000; BARS Wave III to DEP Wave I: *r* = .10, *p*. = 031; BARS Wave III to DEP Wave II: *r* = .11, *p* = .016; BARS Wave III to DEP Wave III: *r* = .20, *p*. = .000).

Table 16. Correlations Between Model Variables Waves I – III and Over Time (excluding controls over time)

Wave 1 (*n* = 465)												
	1	2	3	4	5	6	7	8	9	10	11	12
1. BMI	1.0											
2. Marital Quality	-.01	1.0										
3. Depression	.03	-.34**	1.0									
4. Barriers	.06	-.08	.14**	1.0								
5. Age	.16**	.01	.02	.21**	1.0							
6. Sex	-.18**	-.16**	.14**	.45**	.04	1.0						
7. Minority	.12**	-.07	.16**	.22**	.10*	.02	1.0					
8. Respondent Health	.20**	-.15**	.31**	.15**	.09	.11*	.05	1.0				
9. Chronic Conditions	.22**	-.03	.20**	.20**	.22**	.09*	.07	.33**	1.0			
10. Functional Health	-.07	.02	-.11*	-.08	-.09	-.07	-.06	-.43**	-.18**	1.0		
11. Physical Activity	-.05	.14**	-.21**	-.07	-.01	-.13**	-.04	-.21**	-.15**	.14**	1.0	
12. Financial Stress	.13**	-.22**	.21**	.24**	.01	.04	.11*	.22**	.11*	-.06	-.08	1.0
Wave 2 (*n* = 465)												
1. BMI	1.0											
2. Marital Quality	-.05	1.0										
3. Depression	.01	-.41**	1.0									
4. Barriers	.04	.05	.10*	1.0								
5. Age	.14**	-.03	.03	.09*	1.0							
6. Sex	-.16**	-.10*	.08	.43**	.04	1.0						
7. Minority	.11*	-.10*	.11*	.18**	.10*	.02	1.0					
8. Respondent Health	.26**	-.21**	.34**	.10*	.05	.08	.03	1.0				

Table 16. Correlations Between Model Variables Waves I – III and Over Time (excluding controls over time), continued

9.	Chronic Conditions	.25*	-.14**	.24**	.15**	.11*	.18**	.06	.39**	1.0			
10.	Functional Health	.04	.08	-.16**	-.09	.00	-.08	.03	-.34**	-.18**	1.0		
11.	Physical Activity	-.10*	.17**	-.20**	-.08	-.04	-.17**	-.18**	-.19**	-.12**	.12**	1.0	
12.	Financial Stress	.09	-.27**	.29**	.21**	-.00	.01	.11*	.17**	.14**	-.03	-.08	1.0
Wave 3													
1.	BMI	1.0 (*n*=465)											
2.	Marital Quality	-.07 (*n*=462)	1.0 (*n*=462)										
3.	Depression	.10* (*n*=462)	-.43** (*n*=462)	1.0 (*n*=462)									
4.	Barriers	.12* (*n*=465)	-.03 (*n*=462)	.20** (*n*=462)	1.0 (*n*=465)								
5.	Age	.12** (*n*=465)	-.06 (*n*=462)	.08 (*n*=462)	.08 (*n*=465)	1.0 (*n*=465)							
6.	Sex	-.15** (*n*=465)	-.14** (*n*=462)	.09 (*n*=462)	.28** (*n*=465)	.04 (*n*=465)	1.0 (*n*=465)						
7.	Minority	.10* (*n*=465)	-.06 (*n*=462)	.20** (*n*=462)	.21** (*n*=465)	.10* (*n*=465)	.02 (*n*=465)	1.0 (*n*=465)					
8.	Respondent Health	.27** (*n*=462)	-.15** (*n*=462)	.41** (*n*=462)	.14** (*n*=462)	.11* (*n*=462)	.00 (*n*=462)	.10* (*n*=462)	1.0 (*n*=462)				
9.	Chronic Conditions	.22** (*n*=465)	-.07 (*n*=462)	.24** (*n*=462)	.15** (*n*=465)	.27** (*n*=465)	.05 (*n*=465)	.07 (*n*=465)	.47** (*n*=462)	1.0 (*n*=465)			
10.	Functional Health	-.13* (*n*=465)	.08 (*n*=462)	-.29** (*n*=462)	-.20** (*n*=465)	-.07 (*n*=465)	-.03 (*n*=465)	-.09* (*n*=465)	-.39** (*n*=462)	-.22** (*n*=465)	1.0 (*n*=465)		
11.	Physical Activity	-.09 (*n*=462)	.12* (*n*=462)	-.12** (*n*=462)	-.05 (*n*=462)	.03 (*n*=462)	-.12* (*n*=462)	-.02 (*n*=462)	-.13** (*n*=462)	-.05 (*n*=462)	.06 (*n*=462)	1.0 (*n*=462)	
12.	Financial Stress	.14** (*n*=462)	-.28** (*n*=462)	.29** (*n*=462)	.19** (*n*=462)	-.05 (*n*=462)	-.08 (*n*=462)	.10* (*n*=462)	.26** (*n*=462)	.07 (*n*=462)	-.03 (*n*=462)	-.16** (*n*=462)	1.0 (*n*=462)

Table 16. Correlations Between Model Variables Waves I – III and Over Time (excluding controls over time), continued

	Over Time											
	1	2	3	4	5	6	7	8	9	10	11	12
1. BMI1	1.0 (*n*=465)											
2. BMI2	.93** (*n*=465)	1.0 (*n*=465)										
3. BMI3	.90** (*n*=465)	.91** (*n*=465)	1.0 (*n*=465)									
4. MQ1	-.01 (*n*=465)	-.04 (*n*=465)	-.06 (*n*=465)	1.0 (*n*=465)								
5. MQ2	-.06 (*n*=465)	-.05 (*n*=465)	-.06 (*n*=465)	.66** (*n*=465)	1.0 (*n*=465)							
6. MQ3	-.04 (*n*=462)	-.05 (*n*=462)	-.07 (*n*=462)	.59** (*n*=462)	.65** (*n*=462)	1.0 (*n*=462)						
7. DEP1	.03 (*n*=465)	.04 (*n*=465)	.02 (*n*=465)	-.34** (*n*=465)	-.28** (*n*=465)	-.27** (*n*=462)	1.0 (*n*=465)					
8. DEP2	.02 (*n*=465)	.01 (*n*=465)	.02 (*n*=465)	-.27** (*n*=465)	-.41** (*n*=465)	-.28** (*n*=462)	.45** (*n*=465)	1.0 (*n*=465)				
9. DEP3	.11* (*n*=462)	.10* (*n*=462)	.10* (*n*=462)	-.24** (*n*=462)	-.26** (*n*=462)	-.43** (*n*=462)	.50** (*n*=462)	0.47** (*n*=462)	1.0 (*n*=462)			
10. BARS1	.06 (*n*=465)	.07 (*n*=465)	.06 (*n*=465)	-.08 (*n*=465)	.03 (*n*=465)	-.05 (*n*=462)	.14** (*n*=465)	.14** (*n*=465)	.21** (*n*=462)	1.0 (*n*=465)		
11. BARS2	.05 (*n*=465)	.04 (*n*=465)	.05 (*n*=465)	-.06 (*n*=465)	.05 (*n*=465)	-.05 (*n*=462)	.10* (*n*=465)	.10* (*n*=465)	.18** (*n*=462)	.80** (*n*=465)	1.0 (*n*=465)	
12. BARS3	.09 (*n*=465)	.09 (*n*=465)	.12* (*n*=465)	-.11* (*n*=465)	.03 (*n*=465)	-.03 (*n*=462)	.10* (*n*=465)	.11* (*n*=465)	.20** (*n*=462)	.75** (*n*=465)	.79** (*n*=465)	1.0 (*n*=465)

* $p < .05$; ** $p < .01$.

Tests of the Research Questions

The analyses for this study consist of two phases. First, concurrent analyses are conducted to assess the structural model proposed in Figure 3 at each wave. Second, longitudinal trajectories for marital quality paths to weight gain are assessed using measures across the three waves (see Figure 2). Control variables for depression and weight include age, sex, minority status, respondent's health, chronic conditions, functional health, physical activity, and financial chronic stress. Moderating effects of barriers, sex and age are also assessed.

Model testing is assessed using Mplus software version 6.12 (Muthen & Muthen, 2004) as Mplus allows for the use of weighted data and supports multi-level modeling with latent variables which takes into account non independence resulting from repeated measures. The evaluation of model fit is based on Hu and Bentler's recommendation (1999), such that goodness of fit is assessed by examining the χ^2, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker Lewis Index (TLI), and the Standardized Root Mean Squared Residual (SRMR). Good model fit includes a non-significant chi-square, a CFI and TLI or .95 or greater, an RMSEA of .06 or less, and a SRMR of .08 or less.

Concurrent Analyses

For the concurrent analyses, the following three hypotheses are tested:

Hypothesis XSECT1. Marital quality is negatively related to depression, which in turn is positively related to BMI. Marital quality will have no effect on weight after controlling

for depression as marital quality will reduce depression, which in turn should reduce the likelihood of weight gain through emotional eating.

Hypothesis XSECT2. Marital quality will have a positive effect on weight after controlling for depression (suppressor effect). Counteracting this negative effect on weight through reduced emotional eating, marital quality will increase the likelihood of weight gain through social eating and reduced motivation for weight control through exercise/dieting.

Hypothesis XSECT3. The relationship between marital quality and depression is moderated by the level of barriers to leaving the relationship. A high level of barriers strengthens the effect of low marital quality on depression (depression in turn increasing weight); whereas a low level of barriers does not affect the link between low marital quality and depression.

Hypotheses XSECT1 suggests a mediation model where depression mediates the relationship between marital quality and weight (see Figure 1). Regression analyses (conducted in SPSS) show no direct effect of marital quality on BMI with the exception of Wave III regression model for males (results not shown). Thus, depression does not mediate this relationship as in the cross sectional models, there is no direct effect of marital quality on weight. Detailed model findings will follow.

Hypothesis XSECT2 suggests a suppression effect, where after controlling for marital quality's effect on depression, marital quality should have a positive effect on weight. Models were run with and without controls and by age and sex in which (in addition to the paths suggested in Figure 1) a direct path from marital quality to BMI was

included. Results in all 6 models show that marital quality has no significant effect on BMI. Thus, this suppressor hypothesis is refuted. These model results can be found in Appendix G.

Hypothesis XSECT3 suggests that barriers moderate the relationship between marital quality and depression. Table 17 below shows model results for all three waves without controls testing cross-sectional hypotheses XSECT1 and XSECT3 (see Figure 3). Table 18 shows model results with controls.

Table 17. Model results for Waves I-III without control variables

Unstandardized Parameter Estimates						
	Wave I (*n*=465)		Wave II (*n*=465)		Wave III (*n*=462)	
	Estimate	SE	Estimate	SE	Estimate	SE
On Depression (DEP)						
Marital quality (MQ)	**-2.44*** **	0.38	**-3.08*** **	0.48	**-2.48*** **	0.34
Barriers (BARS)	**0.79***	0.39	**0.99****	0.37	**1.45*** **	0.33
BARS*MQ	-2.00	3.08	-3.61	3.85	**-12.09*** **	2.91
On Body Mass Index (BMI)						
Depression	0.22	0.26	0.17	0.28	0.47	0.38
Intercepts						
BMI	25.37***	0.24	26.25***	0.26	27.08***	0.33
DEP	1.50***	0.40	1.77***	0.39	0.84**	0.29
Residuals						
BMI	21.73***	2.66	23.54***	2.95	27.13***	3.39
DEP	0.77***	0.07	0.67***	0.06	0.54***	0.06
Tests of Model Fit						
Chi Square						
Value	1.50		1.34		3.53	
df	3		3		3	
p value	0.68		0.72		0.32	
CFI	1.00		1.00		0.99	
TLI	1.08		1.05		0.99	
RMSEA	0.00		0.00		0.02	
SRMR	0.02		0.01		0.02	

* $p < .05$; ** $p < .01$, *** $p < .001$

Table 18. Model results for Waves I-III with the addition of control variables

Unstandardized Parameter Estimates						
	Wave I (*n*=465)		Wave II (*n*=465)		Wave III (*n*=462)	
	Estimate	SE	Estimate	SE	Estimate	SE
On Depression (DEP)						
Marital quality (MQ)	**-2.00*** **	0.38	**-2.46*** **	0.48	**-1.93*** **	0.32
Barriers (BARS)	-0.02	0.43	0.41	0.39	**0.81***	0.34
BARS*MQ	-0.18	3.04	-1.82	3.40	**-10.32*** **	2.73
Age	-0.01	0.01	-0.01	0.01	-0.00	0.01
Sex	0.13	0.10	-0.00	0.10	0.04	0.07
Minority	**0.48*** **	0.14	**0.26***	0.13	**0.28****	0.11
Respondent health	**0.11*** **	0.03	**0.07***	0.03	**0.09*** **	0.02
Chronic conditions	0.13	0.08	0.11	0.08	0.02	0.05
Functional health	0.08	0.12	-0.28	0.28	-0.15	0.08
Physical activity	-0.11	0.06	**-0.13***	0.05	-0.05	0.04
Financial stress	0.07	0.05	0.10	0.06	0.09	0.05
On Body Mass Index (BMI)						
Depression	-0.07	0.28	-0.45	0.28	-0.20	0.44
Age	**0.13****	0.04	**0.10***	0.04	**0.11***	0.05
Sex	**-2.48*** **	0.43	**-2.40*** **	0.46	**-1.97*** **	0.49
Minority	0.27	0.51	0.50	0.57	-0.07	0.61
Respondent health	**0.34***	0.15	**0.72*** **	0.14	**0.15****	2.89
Chronic conditions	**1.19***	0.47	**0.81***	0.41	0.53	0.37
Functional health	0.51	0.81	1.78	0.98	0.10	0.60
Physical activity	-0.27	0.25	-0.55	0.28	-0.52	0.31
Financial stress	0.47	0.28	0.33	0.41	**0.77***	0.36

Table 18. Model results for Waves I-III with the addition of control variables, continued

Intercepts						
BMI	20.24**	4.05	14.09*	4.45	22.12**	3.72
DEP	0.06	0.83	2.13	1.28	0.42	0.56
Residuals						
BMI	18.42**	2.38	19.42**	2.54	23.67**	3.06
DEP	0.66**	0.06	0.59**	0.05	0.46**	0.04
Tests of Model Fit						
Chi Square						
Value	6.11		3.15		8.13	
df	3		3		3	
p value	0.11		0.37		0.04	
CFI	0.98		1.00		0.97	
TLI	0.83		0.99		0.78	
RMSEA	0.05		0.01		0.06	
SRMR	0.01		0.01		0.01	

* $p < .05$; ** $p < .01$, *** $p < .001$

Overall model results without controls show that marital quality is negatively related to depression (MLR estimates are -2.44, -3.08, and -2.48, $p < .001$ Waves I to III respectively). Depression is not significantly related to BMI. Thus hypothesis XSECT1 is partially supported. Barriers to leaving are positively related to depression (MLR estimates are 0.79, $p < .05$; 0.99, $p < .01$; and 1.45, $p < .001$ Waves I to III respectively). At Wave III, barriers interact with marital quality on depression (MLR estimate is -12.09, $p < .001$). Thus hypothesis XSECT3 is only supported at Wave III. To understand the interaction effect the following calculation is conducted:

DEP = a + b1(MQ) + b2(BARS) + b3(BARS*MQ)

where DEP = depression; MQ = marital quality; BARS = Barriers; and BARS*MQ is the interaction between barriers and marital quality. Equations are calculated using martial

quality and barrier conditions one standard deviation above and below the mean (to determine High/Low effects):

DEP = Low MQ (.65) + Low BARS (.40) = 0.84 + (-2.48)(.65) + (1.45)(.40) + (-12.09)(.65*.40) = -3.34.

DEP = High MQ (.93) + Low BARS (.40) = 0.84 + (-2.48)(.93) + (1.45)(.40) + (-12.09)(.93*.40) = -5.38.

DEP = Low MQ (.65) + High BARS (.62) = 0.84 + (-2.48)(.65) + (1.45)(.62) + (-12.09)(.65*.62) = -4.75.

DEP = High MQ (.93) + High BARS (.62) = 0.84 + (-2.48)(.93) + (1.45)(.62) + (-12.09)(.93*.62) = -7.54.

These results show that high marital quality reduces depression when barriers are low (-3.34 when marital quality is low versus -5.38 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-4.75 when marital quality is low versus -7.54 when marital quality is high).

Model fit statistics are good at all three waves: (for Wave I: χ^2 (3) = 1.50, p = .68, RMSEA = .00, CFI = 1.00, TLI = 1.08, and SRMR = .02; for Wave II: : χ^2 (3) = 1.34, p = .72, RMSEA = .00, CFI = 1.00, TLI = 1.05, and SRMR = .01; for Wave III: : χ^2 (3) = 3.53, p = .32, RMSEA = .02, CFI = .99, TLI = .99, and SRMR = .02).

When control variables are added to the overall model, marital quality continues to be negatively related to depression (MLR estimates are -2.00, -2.46, and -1.93, $p <$ .001 Waves I to III respectively) but the effect is reduced. Once again, depression has no

significant effect on BMI, thus hypothesis XSECT1 is only partially supported. Barriers are only positively related to depression at Wave III (MLR estimator is .81, $p < .05$). and the interaction of barriers and marital quality continues to be significant but reduced (MLR estimator is -10.32, $p < 001$) supporting hypothesis XSECT3 only at Wave III.

Once again equations are calculated using martial quality and barrier conditions one standard deviation above and below the mean (to determine High/Low effects):

DEP = Low MQ (.65) + Low BARS (.40) = 0.42 + (-1.93)(.65) + (0.81)(.40) + (-10.32)(.65*.40) = -3.19.

DEP = High MQ (.93) + Low BARS (.40) = 0.42 + (-1.93)(.93) + (0.81)(.40) + (-10.32)(.93*.40) = -4.89.

DEP = Low MQ (.65) + High BARS (.62) = 0.42 + (-1.93)(.65) + (0.81)(.62) + (-10.32)(.65*.62) = -4.49.

DEP = High MQ (.93) + High BARS (.62) = 0.42 + (-1.93)(.93) + (0.81)(.62) + (-10.32)(.93*.62) = -6.82.

These results show that high marital quality reduces depression when barriers are low (-3.19 when marital quality is low versus -4.89 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-4.49 when marital quality is low versus -6.82 when marital quality is high).

Minority status is positively related to depression at all three waves (MLR estimates are .48, $p < .001$; .26, $p < .05$; and .28, $p < .01$ Waves I-III respectively). Thus, non-whites have higher levels of depression than whites. Respondent's health is also

positively related to depression at all waves (MLR estimates are .11, $p < .001$; .07, $p < .05$; and .09, $p < .001$ Waves I to III respectively). Thus, individuals in poor health have higher rates of depression. Physical activity is negatively related to depression at Wave II only (MLR estimate is -.13, $p < .05$).

Age is positively related to BMI at all three waves (MLR estimates are .13, $p < .01$; .10, $p <. 05$; and .11, $p < .05$ waves I to III respectively). Thus older individuals have higher BMI scores than younger individuals. Sex is negatively related to BMI (MLR estimates are -2.48, -2.40, and -1.97, $p < .001$ Waves I to III respectively). Men are more likely to have higher BMI values than women. Respondent's health is also positively related to BMI (MLR estimates are .34, $p < .05$; .72, $p < .001$; .15, $p < .01$) indicating that individuals in poor health have higher BMI scores than those in good health. Number of chronic conditions is only significant at Waves I and II (MLR estimates are 1.19 and .81, $p < .05$). Finally, financial stress is positively related to BMI at Wave III only (MLR estimate is .77, $p < .05$).

Model fit statistics no longer meet all of the fit criteria at Waves I and III: (for Wave I: χ^2 (3) = 6.11, $p = .11$, RMSEA = .05, CFI = .98, TLI = .83, and SRMR = .01; for Wave II: : χ^2 (3) = 3.15, $p = .37$, RMSEA = .01, CFI = 1.00, TLI = .99, and SRMR = .01; for Wave III: : χ^2 (3) = 8.13, $p = .04$, RMSEA = .06, CFI = .97, TLI = .78, and SRMR = .01).

Tests by age. The cross-sectional model is examined for differences by age. Table 19 below shows model results for all three waves without controls by age testing cross-sectional hypotheses XSECT1 and XSECT3. Table 20 shows model results with

the addition of controls. The young group consisted of individuals age 34 or younger (24-34) at Wave I; the old group consisted of individuals above age 34 (>34-44) at Wave I.

Table 19. Model results for Waves I-III by age without control variables

Unstandardized Parameter Estimates						
	Wave I		Wave II		Wave III	
	Estimate	SE	Estimate	SE	Estimate	SE
Young[6]						
On Depression (DEP)						
Marital quality (MQ)	**-2.66*** **	0.60	**-3.22*** **	0.67	**-2.70*** **	0.42
Barriers (BARS)	0.49	0.61	0.68	0.53	**1.29** **	0.43
BARS*MQ	-1.99	4.81	-7.05	5.53	**-16.46*** **	4.47
On Body Mass Index (BMI)						
Depression	0.68	0.43	0.69	0.40	**1.18***	0.58
Intercepts						
BMI	24.78**	0.34	25.99**	0.40	27.03**	0.51
DEP	1.84*	0.64	2.03**	0.54	1.05*	0.35
Residuals						
BMI	20.62**	4.02	25.17**	5.20	27.71**	5.29
DEP	0.74**	0.10	0.66**	0.09	0.42**	0.06
N		241		241		240
Old						
On Depression (DEP)						
Marital quality (MQ)	**-2.25*** **	0.44	**-2.89*** **	0.48	**-2.20*** **	0.53
Barriers (BARS)	**1.11***	0.52	**1.39** **	0.49	**1.57** **	0.50
BARS*MQ	-1.94	3.73	1.07	4.08	**-9.44***	3.89

[6] Young: <=34; Old >34 at Wave I

Table 19. Model results for Waves I-III by age without control variables, continued

On Body Mass Index (BMI)						
Depression	-0.22	0.31	-0.44	0.31	-0.18	0.41
Intercepts						
BMI	25.99**	0.33	26.53**	0.32	27.24**	0.39
DEP	1.16*	0.47	1.40*	0.47	0.60	0.46
Residuals						
BMI	21.67**	3.15	20.86**	2.71	25.52**	3.99
DEP	0.80**	0.09	0.66**	0.09	0.66**	0.10
N	224		224		222	
Tests of Model Fit						
Chi Square						
Value	3.44		3.48		5.07	
df	6		6		6	
p value	0.75		0.75		0.54	
CFI	1.00		1.00		1.00	
TLI	1.14		1.07		1.02	
RMSEA	0.00		0.00		0.00	
SRMR	0.02		0.02		0.03	

* $p < .05$; ** $p < .01$, *** $p < .001$

Table 20. Model results for Waves I-III by age with the addition of control variables

Unstandardized Parameter Estimates						
	Wave I		Wave II		Wave III	
	Estimate	SE	Estimate	SE	Estimate	SE
Young						
On Depression (DEP)						
Marital quality (MQ)	**-2.14*** **	0.62	**-2.21*** **	0.60	**-2.19*** **	0.40
Barriers (BARS)	-0.26	0.63	0.29	0.52	**1.07***	0.44
BARS*MQ	1.60	5.00	-3.72	4.33	**-15.58*** **	4.52
Sex	0.16	0.13	0.06	0.14	-0.00	0.10
Minority	**0.51** **	0.19	0.20	0.20	0.23	0.16
Respondent health	0.08	0.04	**0.17*** **	0.04	0.05	0.03
Chronic conditions	0.21	0.12	-0.06	0.10	0.03	0.06
Functional health	-0.11	0.18	0.37	0.25	-0.01	0.11
Physical activity	-0.05	0.10	-0.14	0.08	-0.02	0.05
Financial stress	0.06	0.07	0.08	0.08	0.12	0.07
On Body Mass Index (BMI)						
Depression	0.38	0.44	-0.28	0.41	0.48	0.62
Sex	**-2.76*** **	0.57	**-2.52*** **	0.67	**-2.66*** **	0.68
Minority	0.57	0.86	0.92	0.84	0.69	0.79
Respondent health	0.27	0.18	**0.85*** **	0.19	**0.53** **	0.18
Chronic conditions	1.28	0.88	0.46	0.65	0.37	0.53
Functional health	-0.68	1.05	0.06	1.83	-1.88	1.00
Physical activity	0.19	0.35	-0.61	0.42	**-0.71***	0.35
Financial stress	0.56	0.40	0.79	0.64	0.70	0.46

Table 20. Model results for Waves I-III by age with the addition of control variables, continued

Intercepts						
BMI	29.15**	4.86	23.38*	8.01	34.11**	4.43
DEP	0.93	1.17	-1.29	1.22	0.26	0.62
Residuals						
BMI	17.49**	3.68	20.53**	4.21	22.90**	4.81
DEP	0.63**	0.09	0.56**	0.07	0.39**	0.06
N		241		241		240
			Old			
On Depression (DEP)						
Marital quality (MQ)	**-1.88*** **	0.43	**-2.57*** **	0.49	**-1.60*** **	0.43
Barriers (BARS)	0.28	0.59	0.77	0.53	0.47	0.49
BARS*MQ	-1.61	3.47	2.52	3.77	**-7.65***	3.23
Sex	0.13	0.15	-0.12	0.12	0.10	0.11
Minority	**0.45***	0.18	0.19	0.14	**0.33***	0.14
Respondent health	**0.14*** **	0.03	-0.01	0.04	**0.12*** **	0.03
Chronic conditions	0.04	0.11	**0.28***	0.11	0.02	0.07
Functional health	0.23	0.12	**-0.58***	0.25	-0.18	0.10
Physical activity	**-0.15***	0.07	-0.06	0.06	-0.08	0.06
Financial stress	0.07	0.08	**0.17***	0.07	0.06	0.08
On Body Mass Index (BMI)						
Depression	-0.63	0.34	**-0.78***	0.32	-0.76	0.47
Sex	**-2.04*** **	0.64	**-2.21*** **	0.63	**-1.32***	0.65
Minority	0.21	0.61	0.00	0.69	-0.77	0.81
Respondent health	**0.46***	0.23	**0.56****	0.21	0.37	0.22
Chronic conditions	0.98	0.51	**1.18***	0.49	0.82	0.47

Table 20. Model results for Waves I-III by age with the addition of control variables, continued

Functional health	1.40	1.13	**2.46***	1.02	0.76	0.56
Physical activity	**-0.70***	0.36	-0.63	0.39	-0.42	0.51
Financial stress	0.44	0.38	-0.02	0.42	0.76	0.53
Intercepts						
BMI	20.58**	5.07	16.42**	4.50	24.37**	3.06
DEP	-1.03	0.78	3.64*	1.18	0.06	0.64
Residuals						
BMI	18.89**	2.42	17.58**	2.21	22.69**	3.39
DEP	0.68**	0.07	0.55**	0.07	0.50**	0.06
N	224		224		222	
Tests of Model Fit						
Chi Square						
Value	10.50		8.08		8.17	
df	6		6		6	
p value	0.11		0.23		0.23	
CFI	0.97		0.99		0.99	
TLI	0.76		0.92		0.92	
RMSEA	0.06		0.04		0.04	
SRMR	0.02		0.01		0.01	

* $p < .05$; ** $p < .01$, *** $p < .001$

For both the young and old groups, marital quality is negatively related to depression (MLR estimators for the young are: -2.66, -3.22, -2.70, $p < .001$; for the old are: -2.25, -2.89, -2.20, $p < .001$ Waves I-III respectively). Estimates are stronger for the young than for the older group. Barriers are only related to depression at Wave III for the young (MLR estimate is 1.29, $p < .01$) but are related to depression at all three waves for the old (MLR estimates are 1.11, $p < .05$; 1.39, $p < .01$; 1.57, $p < .01$ Waves I to III

respectively). The interaction between marital quality and barriers is significant at Wave III only for both groups (MLR estimate for the young: -16.46, $p <$. 001; for the old: -9.44, $p < .05$) and is stronger for the young than the old. Depression is positively related to BMI at Wave III only for the young group (MLR estimate is 1.18, $p < .05$). Thus there is partial support for hypothesis XSECT1 and XSECT3 (only at Wave III) when examining the results by age.

Once again equations are calculated using martial quality and barrier conditions one standard deviation above and below the mean (to determine High/Low effects). For the young:

DEP = Low MQ (.65) + Low BARS (.40) = 1.05 + (-2.70)(.65) + (1.29)(.40) + (-16.46)(.65*.40) = -4.47.

DEP = High MQ (.93) + Low BARS (.40) = 1.05 + (-2.70)(.93) + (1.29)(.40) + (-16.46)(.93*.40) = -7.07.

DEP = Low MQ (.65) + High BARS (.62) = 1.05 + (-2.70)(.65) + (1.29)(.62) + (-16.46)(.65*.62) = -6.54.

DEP = High MQ (.93) + High BARS (.62) = 1.05 + (-2.70)(.93) + (1.29)(.62) + (-16.46)(.93*.62) = -10.15.

These results show that high marital quality reduces depression when barriers are low (-4.47 when marital quality is low versus -7.07 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-6.54 when marital quality is low versus -10.15 when marital quality is high).

For the old:

DEP = Low MQ (.65) + Low BARS (.40) = 0.60 + (-2.20)(.65) + (1.57)(.40) + (-9.44)(.65*.40) = -2.66.

DEP = High MQ (.93) + Low BARS (.40) = 0.60 + (-2.20)(.93) + (1.57)(.40) + (-9.44)(.93*.40) = -4.33.

DEP = Low MQ (.65) + High BARS (.62) = 0.60 + (-2.20)(.65) + (1.57)(.62) + (-9.44)(.65*.62) = -3.66.

DEP = High MQ (.93) + High BARS (.62) = 0.60 + (-2.20)(.93) + (1.57)(.62) + (-9.44)(.93*.62) = -5.92.

These results also show that high marital quality reduces depression when barriers are low (-2.66 when marital quality is low versus -4.33 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-3.66 when marital quality is low versus -5.92 when marital quality is high).

Model fit statistics meet all of the fit criteria at all waves: (for Wave I: χ^2 (6) = 3.44, p = .75, RMSEA = .00, CFI = 1.00, TLI = 1.14, and SRMR = .02; for Wave II: : χ^2 (6) = 3.48, p = .75, RMSEA = .00, CFI = 1.00, TLI = 1.07, and SRMR = .02; for Wave III: : χ^2 (6) = 5.07, p = .54, RMSEA = .00, CFI = 1.00, TLI = 1.02, and SRMR = .03).

When control variables are added to the model (see Table 20), marital quality is negatively related to depression for both groups (MLR estimates for the young: -2.14, -2.21, -2.19, $p < .001$; for the old: -1.88, -2.57, -1.60, $p < .001$). Barriers remain significant at Wave III only for the young (MLR estimate is 1.07, $p < .05$) and are no

longer significant for the older group. The interaction between marital quality and barriers remains significant (but somewhat reduced) for both groups at Wave III (MLR estimate for the young: -15.58, $p < .001$; for the old: -7.65, $p < .05$). Depression no longer has an effect on BMI at any wave for the young and is now negatively related to BMI at Wave II only for the older group (MLR estimate is -0.78, $p < .05$). Thus only part of hypothesis XSECT 1 was supported (marital quality – BMI link) and hypothesis XSECT3 was supported only at Wave III (interaction effect of barriers on marital quality).

Once again equations are calculated using martial quality and barrier conditions one standard deviation above and below the mean (to determine High/Low effects). For the young:

DEP = Low MQ (.65) + Low BARS (.40) = 0.26 + (-2.19)(.65) + (1.07)(.40) + (-15.58)(.65*.40) = -4.79.

DEP = High MQ (.93) + Low BARS (.40) = 0.26 + (-2.19)(.93) + (1.07)(.40) + (-15.58)(.93*.40) = -7.14.

DEP = Low MQ (.65) + High BARS (.62) = 0.26 + (-2.19)(.65) + (1.07)(.62) + (-15.58)(.65*.62) = -6.78.

DEP = High MQ (.93) + High BARS (.62) = 0.26 + (-2.19)(.93) + (1.07)(.62) + (-15.58)(.93*.62) = -10.10.

These results show that high marital quality reduces depression when barriers are low (-4.79 when marital quality is low versus -7.14 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital

quality has a stronger effect on depression (-6.78 when marital quality is low versus -10.10 when marital quality is high).

For the old:

DEP = Low MQ (.65) + Low BARS (.40) = 0.06 + (-1.60)(.65) + (0.47)(.40) + (-7.65)(.65*.40) = -2.78.

DEP = High MQ (.93) + Low BARS (.40) = 0.06 + (-1.60)(.93) + (0.47)(.40) + (-7.65)(.93*.40) = -4.09.

DEP = Low MQ (.65) + High BARS (.62) = 0.06 + (-1.60)(.65) + (0.47)(.62) + (-7.65)(.65*.62) = -3.77.

DEP = High MQ (.93) + High BARS (.62) = 0.06 + (-1.60)(.93) + (0.47)(.62) + (-7.65)(.93*.62) = -5.55.

These results also show that high marital quality reduces depression when barriers are low (-2.78 when marital quality is low versus -4.09 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-3.77 when marital quality is low versus -5.55 when marital quality is high).

For the young group, control variables are fairly inconsistent across waves. Minority status is positively related to depression at Wave I (MLR estimate is .51, $p <$ .01) and respondent's health is positively related to depression at Wave II (MLR estimate is .17, $p < .001$). Sex is negatively related to BMI at all three waves (MLR estimates are -2.76, -2.52, and -2.66, $p < .001$ Waves I to III respectively) indicating that males have higher BMI than females. Respondent's health is positively related to BMI at Waves II

and III only (MLR estimates are .85, $p < .001$ for Wave II and .53, $p < .01$ for Wave III). Physical activity is negatively related to BMI at Wave III only (MLR estimate is -.71, $p < .05$).

For the old group, minority status is positively related to depression at Waves I and III (MLR estimates are .45 and .33, $p < .05$). Respondent's health is also positively related to depression at these waves (MLR estimates are .14 and .12, $p < .001$ Waves I and III respectively). Number of chronic conditions is positively related to depression only at Wave II (MLR estimate is .28, $p < .05$) as is financial stress (MLR estimate is .17, $p < .05$). Functional health is also negatively related to depression at Wave II (MLR estimate is -.58, $p < .05$). Physical activity is only related to depression at Wave I (MLR estimate is -.15, $p < .05$). Once again, sex is related to BMI at all waves (MLR estimates are -2.04, -2,21, $p < .001$ and -1.32, $p < .05$) indicating males have higher BMI than females. Respondent's health is positively related to BMI at Waves I and II only (MLR estimates are .46, $p < .05$ and .56, $p < .01$). Chronic conditions and functional health are positively related to BMI only at Wave II (MLR estimates are 1.18 and 2.46, $p < .05$ respectively). Finally physical activity is only negatively related to BMI at Wave I (MLR estimate is -.70, $p < .05$).

With the inclusion of controls, model fit statistics meet all of the fit criteria at Waves II and III and is close to fitting at Wave I: (for Wave I: χ^2 (6) = 10.50, $p = .11$, RMSEA = .06, CFI = .97, TLI = .76, and SRMR = .02; for Wave II: : χ^2 (6) = 8.08, $p = .23$, RMSEA = .04, CFI = .99, TLI = .92, and SRMR = .01; for Wave III: : χ^2 (6) = 8.17, $p = .23$, RMSEA = .04, CFI = .99, TLI = .92, and SRMR = .01).

Tests by sex. The cross-sectional model is also tested for differences by sex. Table 21 below shows model results for all three waves without controls by sex, testing cross-sectional hypotheses XSECT1 and XSECT3. Table 22 shows model results with the addition of controls.

Table 21. Model results for Waves I-III by sex without control variables

Unstandardized Parameter Estimates						
	Wave I		Wave II		Wave III	
	Estimate	SE	Estimate	SE	Estimate	SE
Male						
On Depression (DEP)						
Marital quality (MQ)	**-2.13****	0.76	**-2.21*****	0.64	**-1.66*****	0.46
Barriers (BARS)	0.85	0.70	1.23	0.65	**2.00*****	0.56
BARS*MQ	-0.69	6.83	1.01	5.61	**-8.84***	4.04
On Body Mass Index (BMI)						
Depression	0.36	0.46	-0.37	0.38	0.20	0.42
Intercepts						
BMI	26.53**	0.36	27.07**	0.37	27.92**	0.46
DEP	1.15	0.67	0.94	0.55	-0.07	0.41
Residuals						
BMI	19.08**	3.57	21.98**	4.65	26.73**	5.40
DEP	0.60**	0.07	0.59**	0.09	0.44	0.07
N		218		218		215
Female						
On Depression (DEP)						
Marital quality (MQ)	**-2.52*****	0.54	**-3.57*****	0.65	**-2.99*****	0.47
Barriers (BARS)	0.38	0.61	0.73	0.54	0.92	0.48
BARS*MQ	-1.92	4.32	-2.91	4.99	**-11.75****	4.37
On Body Mass Index (BMI)						
Depression	0.41	0.29	**0.75***	0.36	0.84	0.55
Intercepts						
BMI	24.22**	0.31	25.27**	0.33	26.18**	0.42
DEP	1.84*	0.63	2.30**	0.59	1.51**	0.43

Table 21. Model results for Waves I-III by sex without control variables, continued

Residuals						
BMI	21.78**	3.66	22.55**	2.55	25.40**	3.11
DEP	0.94**	0.11	0.74**	0.08	0.63**	0.09
N	247		247		247	
Tests of Model Fit						
Chi Square						
Value	14.05		8.19		11.53	
df	6		6		6	
p value	0.03		0.22		0.07	
CFI	0.81		0.97		0.94	
TLI	0.55		0.94		0.86	
RMSEA	0.08		0.04		0.06	
SRMR	0.05		0.03		0.04	

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 22. Model results for Waves I-III by sex with the addition of control variables

Unstandardized Parameter Estimates						
	Wave I		Wave II[7]		Wave III	
	Estimate	SE	Estimate	SE	Estimate	SE
Male						
On Depression (DEP)						
Marital quality (MQ)	**-2.25****	0.73	**-1.31***	0.65	**-1.68*****	0.44
Barriers (BARS)	-0.16	0.62	0.35	0.64	**1.45****	0.46
BARS*MQ	-1.04	6.77	3.85	5.10	**-8.00****	2.96
Age	-0.00	0.01	-0.01	0.01	-0.01	0.01
Minority	**0.58*****	0.16	0.17	0.18	0.32	0.17
Respondent health	**0.08***	0.04	0.07	0.04	0.04	0.03
Chronic conditions	0.19	0.12	0.04	0.16	0.11	0.07
Functional health	-0.06	0.17	_____	_____	-0.18	0.12
Physical activity	-0.01	0.07	**-0.14***	0.07	0.01	0.05
Financial stress	0.09	0.08	**0.18***	0.08	-0.03	0.07
On Body Mass Index (BMI)						
Depression	0.02	0.53	**-0.96***	0.41	-0.18	0.48
Age	**0.12***	0.06	0.11	0.07	0.12	0.08
Minority	-0.09	0.87	-0.24	0.77	-0.92	0.84
Respondent health	0.33	0.23	**0.63****	0.23	**0.43***	0.22
Chronic conditions	**1.47***	0.66	-0.05	0.56	-0.07	0.53
Functional health	1.49	0.83	_____	_____	-0.08	0.96
Physical activity	-0.22	0.35	-0.76	0.43	-0.35	0.48

[7] Analysis was run without control variable functional health for Wave II due to variable non-normality causing model non-identification (there were only two males with moderate functional impairment; the remaining males had no impairment).

Table 22. Model results for Waves I-III by sex with the addition of control variables, continued

Financial stress	0.44	0.44	0.78	0.70	0.54	0.59
Intercepts						
BMI	14.45*	5.35	19.72**	3.31	21.79**	6.16
DEP	0.94	1.16	0.34	0.65	0.46	0.82
Residuals						
BMI	17.13**	3.21	19.92**	4.07	24.94**	5.05
DEP	0.51**	0.06	0.54**	0.08	0.38**	0.06
N		218		218		215
Female						
On Depression (DEP)						
Marital quality (MQ)	**-1.89*** **	0.51	**-3.00*** **	0.65	**-1.83*** **	0.45
Barriers (BARS)	0.11	0.56	0.42	0.46	0.38	0.43
BARS*MQ	0.03	3.91	0.02	3.95	**-11.22** **	3.93
Age	-0.00	0.01	-0.01	0.01	0.01	0.01
Minority	0.37	0.21	0.27	0.12	0.16	0.13
Respondent health	**0.14*** **	0.04	**0.10** **	0.04	**0.15*** **	0.03
Chronic conditions	0.09	0.11	0.17	0.10	-0.09	0.07
Functional health	0.21	0.18	_____	_____	-0.12	0.11
Physical activity	**-0.20***	0.10	-0.13	0.07	-0.07	0.06
Financial stress	0.04	0.07	0.04	0.08	**0.25*** **	0.07
On Body Mass Index (BMI)						
Depression	-0.14	0.28	-0.23	0.34	-0.26	0.65
Age	**0.13***	0.06	0.08	0.05	0.09	0.06
Minority	0.50	0.68	1.29	0.77	0.96	0.81
Respondent health	**0.39***	0.18	**0.76*** **	0.17	0.35	0.20

Table 22. Model results for Waves I-III by sex with the addition of control variables, continued

Chronic conditions	0.88	0.69	**1.18***	0.48	**1.24****	0.43
Functional health	-0.95	1.54	_____	_____	-0.06	0.77
Physical activity	-0.33	0.35	-0.35	0.40	-0.62	0.42
Financial stress	0.40	0.35	0.03	0.41	**1.18*****	0.37
Intercepts						
BMI	20.40*	7.39	15.86**	2.31	18.39**	4.18
DEP	-0.44	1.06	1.38	0.72	0.06	0.75
Residuals						
BMI	19.31**	3.26	18.23**	2.08	21.32**	3.01
DEP	0.79**	0.10	0.63**	0.07	0.47**	0.05
N	247		247		247	
Tests of Model Fit						
Chi Square						
Value	9.70		3.49		12.72	
df	6		6		6	
p value	0.14		0.75		0.05	
CFI	0.97		1.00		0.96	
TLI	0.76		1.11		0.74	
RMSEA	0.05		0.00		0.07	
SRMR	0.02		0.01		0.02	

* $p < .05$; ** $p < .01$; $p < .001$

When the cross-sectional model is tested by sex, marital quality is negatively related to depression at all three waves for both males and females (MLR estimates for males: -2.13, $p < .01$, -2.21, $p < .001$ and -1.66, $p < .001$; for women: -2.52, -3, 57, -2,99, $p < .001$ Waves I to III respectively). Barriers are only positively related to depression for males at Wave III (MLR estimate is 2.00, $p < .001$). The interaction

between marital quality and barriers is significant for both groups at Wave III only (MLR estimates are -8.84, $p < .05$ for males and -11.75, $p < .01$ for females) and is stronger for females than for males. The link between depression and BMI is only significant at Wave II for females (MLR estimate is .75, $p < .05$).

Equations are calculated using martial quality and barrier conditions one standard deviation above and below the mean (to determine High/Low effects). For males:

DEP = Low MQ (.65) + Low BARS (.40) = -0.07 + (-1.66)(.65) + (2.00)(.40) + (-8.84)(.65*.40) = -2.65.

DEP = High MQ (.93) + Low BARS (.40) = -0.07 + (-1.66)(.93) + (2.00)(.40) + (-8.84)(.93*.40) = -4.10.

DEP = Low MQ (.65) + High BARS (.62) = -0.07 + (-1.66)(.65) + (2.00)(.62) + (-8.84)(.65*.62) = -3.47.

DEP = High MQ (.93) + High BARS (.62) = -0.07 + (-1.66)(.93) + (2.00)(.62) + (-8.84)(.93*.62) = -5.45.

These results show that high marital quality reduces depression when barriers are low (-2.65 when marital quality is low versus -4.10 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-3.47 when marital quality is low versus -5.45 when marital quality is high).

For females:

DEP = Low MQ (.65) + Low BARS (.40) = 1.51 + (-2.99)(.65) + (0.92)(.40) + (-11.75)(.65*.40) = -3.12.

DEP = High MQ (.93) + Low BARS (.40) = 1.51 + (-2.99)(.93) + (0.92)(.40) + (-11.75)(.93*.40) = -5.27.

DEP = Low MQ (.65) + High BARS (.62) = 1.51 + (-2.99)(.65) + (0.92)(.62) + (-11.75)(.65*.62) = -4.60.

DEP = High MQ (.93) + High BARS (.62) = 1.51 + (-2.99)(.93) + (0.92)(.62) + (-11.75)(.93*.62) = -7.48.

These results also show that high marital quality reduces depression when barriers are low (-3.12 when marital quality is low versus -5.27 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-4.60 when marital quality is low versus -7.48 when marital quality is high).

Model fit statistics meet all of the fit criteria only at Wave II: (for Wave I: χ^2 (6) = 14.05, p = .03, RMSEA = .08, CFI = .81, TLI = .55, and SRMR = .05; for Wave II: : χ^2 (6) = 8.19, p = .22, RMSEA = .04, CFI = .97, TLI = .94, and SRMR = .03; for Wave III: : χ^2 (6) = 11.53, p = .07, RMSEA = .06, CFI = .94, TLI = .86, and SRMR = .04).

With the addition of control variables, marital quality continues to be negatively related to depression for both groups at all three waves (MLR estimates for males: -2.23, p < .01, -1.31, p < .05, and -1.68, p < .001; for females: -1.89, -3.00, and -1.83, p < .001 Waves I to III respectively). Barriers remain positively related to depression at Wave III for males (MLR estimate is 1.45, p < .01). The interaction between marital quality and barriers remains significant for both groups at Wave III (MLR estimate is -8.00, p < .01 for males; -11.22, p < .001 for females) showing a stronger effect for females.

Depression is now negatively related to BMI for males at Wave II only (MLR estimate is -.96, $p < .05$).

Equations are calculated using martial quality and barrier conditions one standard deviation above and below the mean (to determine High/Low effects). For males:

DEP = Low MQ (.65) + Low BARS (.40) = 0.46 + (-1.68)(.65) + (1.45)(.40) + (-8.00)(.65*.40) = -2.13.

DEP = High MQ (.93) + Low BARS (.40) = 0.46 + (-1.68)(.93) + (1.45)(.40) + (-8.00)(.93*.40) = -3.50.

DEP = Low MQ (.65) + High BARS (.62) = 0.46 + (-1.68)(.65) + (1.45)(.62) + (-8.00)(.65*.62) = -2.96.

DEP = High MQ (.93) + High BARS (.62) = 0.46 + (-1.68)(.93) + (1.45)(.62) + (-8.00)(.93*.62) = -4.82.

These results show that high marital quality reduces depression when barriers are low (-2.13 when marital quality is low versus -3.50 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-2.96 when marital quality is low versus -4.82 when marital quality is high).

For females:

DEP = Low MQ (.65) + Low BARS (.40) = .06 + (-1.83)(.65) + (0.38)(.40) + (-11.22)(.65*.40) = -3.89.

DEP = High MQ (.93) + Low BARS (.40) = .06 + (-1.83)(.93) + (0.38)(.40) + (-11.22)(.93*.40) = -5.66.

DEP = Low MQ (.65) + High BARS (.62) = .06 + (-1.83)(.65) + (0.38)(.62) + (-11.22)(.65*.62) = -5.42.

DEP = High MQ (.93) + High BARS (.62) = .06 + (-1.83)(.93) + (0.38)(.62) + (-11.22)(.93*.62) = -7.88.

These results also show that high marital quality reduces depression when barriers are low (-3.89 when marital quality is low versus -5.66 when marital quality is high) but this effect is less pronounced than when barriers are high. When barriers are high, marital quality has a stronger effect on depression (-5.42 when marital quality is low versus -7.88 when marital quality is high).

Significance of control variables is fairly inconsistent across waves. For males, minority status is positively related to depression at Wave I (MLR estimate is .58, $p <$ .001). Respondent's health is also positively related to depression at Wave I only (MLR estimate is .08, $p < .05$). Physical activity is negatively related to depression at Wave II (MLR estimate is -.14, $p < .05$) and financial stress is positively related to depression at Wave II only (MLR estimate is .18, $p < .05$). Age is positively related to BMI at Wave I only (MLR estimate is .12, $p < .05$) as is chronic conditions (MLR estimate is 1.47, $p <$ .05). Respondent's health is positively related to BMI at Waves II and III (MLR estimates are .63, $p < .01$ and .43, $p < .05$ Waves II and III respectively).

For females, respondent's health is positively related to depression at all waves (MLR estimates are .14, $p < .001$, .10, $p < .01$, .15, $p < .001$ Waves I to III respectively). Physical activity is negatively related to depression at Wave I only (MLR estimate is -.20, $p < .05$) while financial stress is positively related to depression at Wave III only (MLR

estimate is .25, $p < .001$). Age is positively related to BMI at Wave I only (MLR estimate is .13, $p < .05$). Respondent's health is positively related to BMI at Waves I and II (MLR estimates are .39, $p < .05$ and .76, $p < .001$). Chronic conditions are positively related to BMI at Waves II and III (MLR estimate is 1.18, $p < .05$ and 1.24, $p < .01$ Waves II and III respectively). Financial stress is positively related to BMI only at Wave III (MLR estimate is 1.18, $p < .001$).

Model fit statistics meet all of the fit criteria only at Wave II: (for Wave I: χ^2 (6) = 9.70, p = .14, RMSEA = .05, CFI = .97, TLI = .76, and SRMR = .02; for Wave II: : χ^2 (6) = 3.49, p = .75, RMSEA = .00, CFI = 1.00, TLI = 1.11, and SRMR = .01; for Wave III: : χ^2 (6) = 12.72, p = .05, RMSEA = .07, CFI = .96, TLI = .74, and SRMR = .02).

Longitudinal Analyses

For the longitudinal model testing, control variables are the same as used in the concurrent analyses. Figure 2 depicts the proposed links between marital quality and weight over time. Stability paths, marital protection paths, relationship commitment paths and psychological stress paths are outlined. The moderating effects of barriers to leaving, sex and age are also described. Proposed hypotheses are listed below for reference.

Proposed Hypotheses:

Longitudinal Model: Stability Paths

Hypothesis LONG1. Marital quality will be positively related to marital quality over time. (Marital quality at time one will be positively related to marital quality at time

two; marital quality at time two will be positively related to marital quality at time three). MQ1 → (+) → MQ2 (+) → MQ3. [See figure 2, stability path 1].

Hypothesis LONG2. Depression will be positively related to depression over time. (Depression at time one will be positively related to depression at time two; depression at time two will be positively related to depression at time three). DEPRESSION1 → (+) DEPRESSION2 → (+) DEPRESSION3. [See figure 2, stability path 2].

Hypothesis LONG3. Weight will be positively related to weight over time. (BMI at time one will be positively related to BMI at time two; BMI at time two will be positively related to BMI at time three). WEIGHT1 → (+) WEIGHT2 → (+) WEIGHT3. [See figure 2, stability path 3].

Longitudinal Modal: Marriage Protection Hypothesis

Hypothesis MPROT1. Initial marital quality will act as a buffer against stressors and will reduce the likelihood of an increase in depression, thus marital quality at time one will decrease depression at time two (controlling for depression at time one); marital quality at time two will decrease depression at time three (controlling for depression at time two). MQ1 → (-) DEPRESSION2 (net of DEPRESSION1); MQ2 → (-) DEPRESSION3 (net of DEPRESSION2). [See figure 2, marriage protection path 1].

Longitudinal Modal: Relationship Commitment Hypothesis

Hypothesis RCOMM1. Marital quality at time one will be positively related to BMI at time two (controlling for BMI at time one and controlling for marital quality at time one on depression at time 2); marital quality at time two will be positively related to

BMI at time three (controlling for BMI at time two and marital quality at time two on depression at time three). MQ1 → (+) WEIGHT2 (net of WEIGHT1); MQ2 → (+) WEIGHT3 (net of WEIGHT2). [See figure 2, relationship commitment path one]. Initial marital quality will enhance commitment to the relationship and thus reduce consideration of alternatives to the relationship. This will then increase the likelihood of social eating and decreased impression management and thus weight gain. (This effect is net of the counteracting emotional eating effect that occurs for those with low marital quality resulting in high depression).

Longitudinal Modal: Psychological Stress Hypotheses

Hypothesis PSYSTRESS1a. Marital quality will decrease depression and depression will increase weight gain. Thus, marital quality at time two (controlling for marital quality at time one) will be negatively related to depression at time two (controlling for depression at time one); marital quality at time three (controlling for marital quality at time two) will be negative related to depression at time three (controlling for depression at time two). MQ2 (net of MQ1) → **(-)** DEPRESSION2 (net of DEPRESSION1); MQ3 (net of MQ2) → (-) DEPRESSION 3 (net of DEPRESSION2). [See figure 2, psychological stress path one].

Hypothesis PSYSTRESS1b. Depression at time two (controlling for depression at time one) will be positively related to weight at time two (controlling for weight at time one); depression at time three (controlling for weight at time two) will be positively related to weight at time three (controlling for weight at time two). DEPRESSION2 (net of DEPRESSION1) → (+) WEIGHT2 (net of WEIGHT1); DEPRESSION3 (net of

DEPRESSION2) → (+) WEIGHT 3 (net of WEIGHT2). [See figure 2 psychological stress path 3]. Thus, the effect of marital quality on weight is mediated by depression.

Hypothesis PSYSTRESS2. Depression at time one will be positively related to weight at time two (controlling for weight at time one); depression at time two (controlling for depression at time one) will be positively related to weight at time three (controlling for weight at time two). DEPRESSION1 → (+) WEIGHT2 (net of WEIGHT1); DEPRESSION2 (net of DEPRESSION1) → (+) WEIGHT 3 (net of WEIGHT2). [See figure 2 psychological stress path 2].

Moderating Hypothesis: Moderating Effect of Barriers

Hypothesis MODEFF1. When barriers are high, psychological stressor effects are increased as reduced viability of entering the relationship market coupled with low marital quality will create feelings of depression due to lack of alternatives (feeling stuck). (PSP1 will be negative and PSP2 will be strengthened).

Moderating Hypotheses: Moderating Effect of Age

Hypothesis MODEFF2. Relationship commitment effects will be weaker for the old resulting in lesser weight gain for those with high marital quality as the highly satisfied partner will maintain lower weight in an effort to keep his/her partner's satisfaction high in the relationship; the unsatisfied partner has nothing to gain by keeping trim as reduced viability in the relationship market makes weight loss less promising. (RCP1 will be positive and weaker for the old than for the young).

Hypothesis MODEFF3. Psychological stressor effects will be stronger for the old as reduced viability in the relationship market combined with low marital quality will

lead to feelings of depression due to lack of alternatives (feeling stuck). (PSP1 will be negative and stronger for the old than for the young; PSP2 in turn will be strengthened).

Moderating Hypotheses: Moderating Effect of Sex

Hypothesis MODEFF4. Marriage protection effects will be stronger for men resulting in less depression over time for those with high marital quality as men need marriage for expressive functioning more than women do. (MPP1 will be negative and stronger for males than for females).

Hypothesis MODEFF5. Relationship commitment effects will be weaker for women resulting in less weight gain regardless of high marital quality as weight loss has a stronger impact on relationship marketability for women than for men. (RCP1 will be positive and weaker for females than for males).

Tests of the Longitudinal Model

To test these hypotheses, models were run with and without barriers and with and without controls for the entire sample and then again by age and by sex. Table 23 provides model results for the overall models. As the pattern of findings is similar across the four model runs, result for the overall model with barriers and with controls will be discussed in detail followed by the table speaking to each of the hypotheses presented.

Overall model. Stability paths testing hypotheses LONG1-3 are all significant. Marital quality at Wave I is highly related to marital quality at Wave II (MLR estimate is .65, $p < .001$) and marital quality at Wave II is highly related to marital quality at Wave III (MLR estimate is .71, $p < .001$). Depression is also related to itself over time (MLR estimate for Wave I to II is .35, $p < .001$ and for Wave II to III is .34, $p < .001$). BMI is

also related over time (MLR estimate for Wave I to II is .97, $p < .001$ and for Wave II to III is .98, $p < .001$). Barriers at Wave I are related to barriers at Wave II (MLR estimate is .81, $p < .001$).

The marital protection hypothesis MPROT1 is only partially supported. Marital quality at Wave I has no significant effect on depression at Wave II, but marital quality at Wave II does have a positive relationship to depression at Wave III (MLR estimate is 1.62, $p < .001$). This however is in the opposite direction than predicted and intuitively does not make sense (marital quality causing depression). Barriers at Wave I are positively related to depression at Wave II (MLR estimate is .69, $p < .05$) but are not significantly related from Wave II to Wave III.

The relationship commitment hypothesis RCOMM1 is not supported. There is no significant relationship between marital quality and BMI over time. Psychological stress paths (hypothesis PSYSTRESS1a) are supported. Marital quality at Wave II has a negative effect on depression at Wave II (MLR estimate is -2.80, $p < .001$) and marital quality at Wave III is negatively related to depression at Wave III (MLR estimate is -2.09, $p < .001$). Hypotheses PSYSTRESS1b and PSYSTRESS2 are not supported. Depression does not have a significant effect on BMI concurrently (PSYSTRESS1a) or over time (PSYSTRESS2).

Finally, MODEFF1, the moderating effect of barriers hypothesis has little support. In comparing the model with controls without barriers to the one with barriers (model run 3 and 4), the effects of marital quality on depression are strengthened with the addition of barriers in the model at Wave II (MLR estimate for marital quality Wave II on

depression Wave II without barriers is -2.67, $p < .001$ compared to -2.80, $p < .001$ with barriers in the model; the increase in effect is minimal from marital quality Wave III to depression Wave III (-2.08, $p < .001$ without barriers compared to -2.09, $p < .001$ with barriers)). The interaction of marital quality and barriers is also non-significant in the model.

Significant controls on depression are minority status (MLR estimate is .21, $p < .05$) and respondent's health (MLR estimate is .07, $p < .001$) which are positively related. Functional health is negatively related to depression (MLR estimate is -.21, $p < .05$). Financial stress was the only control variable that was significantly related to BMI (MLR estimate is .28, $p < .05$).

Model fit statistics do not meet fit criteria. For example, for the longitudinal model with barriers and with controls χ^2 (122) = 434.24, $p = .00$, RMSEA = .07, CFI = .87, TLI = .83, and SRMR = .10.

Table 23. Longitudinal model results with and without barriers and controls

Unstandardized Parameter Estimates								
	Without controls and barriers (*n* = 465)		Without controls with barriers (*n* = 465)		With controls without barriers (*n* = 462)		With controls and with barriers (*n* = 462)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Marital Protection Paths								
DEPw2 on MQw1	0.79	0.54	0.87	0.53	0.73	0.54	0.81	0.54
DEPw3 on MQw2	**1.76*** **	0.49	**1.66*** **	0.50	**1.66*** **	0.46	**1.62*** **	0.46
DEPw2 on BARSw1	_____	_____	**0.72***	0.31	_____	_____	**0.69***	0.30
DEPw3 on BARSw2	_____	_____	**0.67***	0.29	_____	_____	0.31	0.31
Relationship Commitment Paths								
BMIw2 on MQw1	-0.81	0.85	-0.81	0.85	-0.81	0.85	-0.81	0.85
BMIw3 on MQw2	0.63	1.04	0.63	1.04	0.96	1.05	0.96	1.05
Psychological Stress Paths								
DEPw2 on MQw2	**-2.74*** **	0.58	**-2.87*** **	0.59	**-2.67*** **	0.59	**-2.80*** **	0.60
DEPw3 on MQw3	**-2.42*** **	0.47	**-2.36*** **	0.46	**-2.08*** **	0.42	**-2.09*** **	0.42
BMIw2 on DEPw2	-0.00	0.19	-0.00	0.19	-0.01	0.19	-0.01	0.19
BMIw3 on DEPw3	-0.01	0.14	-0.01	0.14	-0.08	0.15	-0.08	0.15
BMIw2 on DEPw1	0.18	0.12	0.18	0.12	0.18	0.12	0.18	0.12
BMIw3 on DEPw2	0.14	0.16	0.14	0.16	0.12	0.16	0.12	0.16
DEPw2 on BARS*MQw1	_____	_____	-0.63	2.52	_____	_____	-0.69	2.53
DEPw3 on BARS*MQw2	_____	_____	-0.07	2.43	_____	_____	0.06	2.26
Stability Paths								
MQw2 on MQw1	**0.65*** **	0.05	**0.65*** **	0.05	**0.65*** **	0.05	**0.65*** **	0.05
MQw3 on MQw2	**0.71*** **	0.06	**0.71*** **	0.06	**0.71*** **	0.06	**0.71*** **	0.06

Table 23. Longitudinal model results with and without barriers and controls, continued

DEPw2 on DEPw1	**0.36*** **	0.06	**0.35*** **	0.06	**0.37*** **	0.06	**0.35*** **	0.06
DEPw3 on DEPw2	**0.42*** **	0.06	**0.40*** **	0.06	**0.34*** **	0.06	**0.34*** **	0.06
BMIw2 on BMIw1	**0.97*** **	0.03	**0.97*** **	0.03	**0.97*** **	0.03	**0.97*** **	0.03
BMIw3 on BMIw2	**0.99*** **	0.03	**0.99*** **	0.03	**0.98*** **	0.03	**0.98*** **	0.03
BARSw2 on BARSw1	_____	_____	**0.81*** **	0.03	_____	_____	**0.81*** **	0.03
Correlations								
MQw1 with DEPw1	**-0.04*** **	0.01	**-0.04*** **	0.01	**-0.04*** **	0.01	**-0.04*** **	0.01
DEPw1 with BMIw1	0.20	0.24	0.20	0.24	0.21	0.24	0.21	0.24
MQw1 with BMIw1	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.03
BARSw1 with MQw1	_____	_____	-0.00	0.00	_____	_____	-0.00	0.00
DEPw1 with BARSw1	_____	_____	**0.02***	0.01	_____	_____	**0.02***	0.01
BMIw1 to BARSw1	_____	_____	0.02	0.03	_____	_____	0.02	0.03
Controls on Depression (Wave III)								
Age					-0.00	0.01	-0.00	0.01
Sex					0.05	0.06	0.02	0.07
Minority					**0.22***	0.10	**0.21***	0.10
Respondent's health					**0.07*** **	0.02	**0.07*** **	0.02
Chronic conditions					0.01	0.06	0.01	0.06
Functional health					**-0.22***	0.09	**-0.21***	0.09
Physical activity					-0.04	0.04	-0.04	0.04
Financial stress					0.08	0.05	0.07	0.05
Controls on Body Mass Index (Wave III)								
Age					0.01	0.02	0.01	0.02
Sex					0.10	0.23	0.10	0.23
Minority					-0.48	0.30	-0.48	0.30

Table 23. Longitudinal model results with and without barriers and controls, continued

Respondent's health					0.09	0.07	0.09	0.07
Chronic conditions					-0.05	0.17	-0.05	0.17
Functional health					0.21	0.24	0.21	0.24
Physical activity					-0.07	0.14	-0.07	0.14
Financial stress					**0.28***	0.14	**0.28***	0.14
Means								
BMIw1	25.38**	0.24	25.38**	0.24	25.37**	0.24	25.37**	0.24
DEPw1	-0.07	0.05	-0.07	0.05	-0.07	0.05	-0.07	0.05
MQw1	0.81**	0.01	0.81**	0.01	0.81**	0.01	0.81**	0.01
BARSw1	---	---	0.51**	0.01	---	---	0.51**	0.01
Intercepts								
BMIw2	2.32*	0.99	2.32*	0.99	2.33*	0.99	2.33*	0.99
DEPw2	1.37**	0.35	1.04*	0.39	1.36**	0.35	1.04*	0.39
MQw2	0.27**	0.04	0.27**	0.04	0.27**	0.04	0.27**	0.04
BMIw3	0.57	1.12	0.57	1.12	-0.89	2.03	-0.89	2.03
DEPw3	0.18	0.29	-0.11	0.32	0.09	0.55	0.04	0.55
MQw3	0.22**	0.05	0.22**	0.05	0.22**	0.05	0.22**	0.05
BARSw2	---	---	0.09**	0.02	---	---	0.09**	0.02
Variances								
BMIw1	21.58**	2.77	21.58**	2.77	21.67**	2.78	21.67**	2.78
DEPw1	0.88**	0.08	0.88**	0.08	0.88**	0.08	0.88**	0.08
MQw1	0.02**	0.00	0.02**	0.00	0.02**	0.00	0.02**	0.00
BARSw1	---	---	0.02**	0.00	---	---	0.02**	0.00
Residuals								
BMIw2	3.09**	0.39	3.09**	0.39	3.10**	0.39	3.10**	0.39
DEPw2	0.59**	0.06	0.58**	0.06	0.58**	0.06	0.58**	0.06
MQw2	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BMIw3	4.36**	0.41	4.37**	0.41	4.24**	0.40	4.24**	0.40
DEPw3	0.48**	0.05	0.47**	0.05	0.41**	0.04	0.41**	0.04
MQw3	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BARSw2	---	---	0.01**	0.00	---	---	0.01**	0.00
Tests of Model Fit								
Chi Square								
Value		115.99		132.82		296.47		434.24
df		17		50		73		122

Table 23. Longitudinal model results with and without barriers and controls, continued

p value	0.00	0.00	0.00	0.00
CFI	0.94	0.96	0.89	0.87
TLI	0.87	0.93	0.84	0.83
RMSEA	0.11	0.06	0.08	0.07
SRMR	0.06	0.06	0.10	0.10

* $p < .05$; ** $p < .01$; $p < .001$

Tests by age. Table 24 below shows model results with and without barriers and controls by age. Recall the young group includes individuals less than or equal to 34 (24-34 years old) at Wave I and the old group is made up of individuals over 34 at wave I (>34 -44 years of age). Once again, as the model results are relatively parallel for all 4 model runs, only the model with barriers and controls will be described in detail below.

Stability path hypotheses (LONG1 to LONG3) are all supported for both the young and old groups. Marital quality is positively related to itself over time (MLR estimates for the young: .61 Wave I to II and .64 Wave II to III, $p < .001$; for the old: .69, Wave I to II and .77, Wave II to III, $p < .001$). Depression is also related over time (MLR estimates for the young: .37 Wave I to II and .36 Wave II to III, $p < .001$; for the old: .34 Wave I to II and .33 Wave II to III, $p < .001$). BMI is related over time (MLR estimates for the young: .99 and .95, $p < .001$ Wave I to II and Wave II to III respectively; for the old: .93 and 1.01, $p < .001$ Wave I to II and Wave II to III respectively). Finally, barriers are also related over time for both groups (MLR estimates are .82, $p < .001$ Wave I to II for the young and .84, $p < .001$ Wave I to II for the old).

The marital protection hypothesis (MPROT1) is not supported for both groups. The pattern of results is the same for both young and old. Marital quality at Wave I has

no significant effect on depression at Wave II but marital quality at Wave II does have a positive relationship with depression at Wave III (MLR estimate is 1.45, $p < .05$ for the young and 1.89, $p < .001$ for the old) indicating the effect is stronger for the older group. However, as with the overall model, this effect is in the opposite direction than predicted. Here marital quality is causing depression.

The relationship commitment hypothesis (RCOMM1) is not supported. Marital quality does not affect BMI over time. Psychological stress hypothesis 1a (PSYSTRESS1a) is supported for both groups. Marital quality at Wave II is negatively related to depression at Wave II (for the young MLR estimate is -2.95, $p < .001$; for the old -2.54, $p < .001$). Marital quality at Wave III is also negatively related to depression at Wave III (MLR estimate for the young: -2.23, $p < .001$; for the old, -2.09, $p < .001$). Note the estimates are stronger for the young than the old. For the old group only, depression at Wave II is negatively related to BMI at Wave II (hypothesis PSYSTRESS1b) (MLR estimate is -.27, $p < .05$) but had no effect at Wave III. This effect is also in the opposite direction than predicted – here depression decreased BMI. Hypothesis PSYSTRESS2 is not supported (depression did not affect weight over time). MODEFF1 is also not supported, barriers and the marital quality barrier interaction had no effect for either group.

None of the control variables are significantly related to depression or BMI for the young group. For the older group, respondent's health is positively related to depression (MLR estimate is .11, $p < .001$) and functional health is negatively related to depression (MLR estimate is -.22, $p < .05$). No controls are significantly related to BMI.

Once again, the models did not meet fit criteria with or without the inclusion of barriers or controls on the model. For example, for the model with barriers and controls included, χ^2 (226) = 618.30, p = .00, RMSEA = .09, CFI = .86, TLI = .81, and SRMR = .11.

Table 24. Longitudinal model results with and without barriers and controls by age

Unstandardized Parameter Estimates								
	Without controls and barriers		Without controls with barriers		With controls without barriers		With controls and with barriers	
Young								
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Marital Protection Paths								
DEPw2 on MQw1	1.15	0.76	1.26	0.75	1.15	0.76	1.26	0.75
DEPw3 on MQw2	**1.33***	0.65	**1.34***	0.67	**1.40***	0.64	**1.45***	0.65
DEPw2 on BARSw1	_____	_____	0.59	0.45	_____	_____	0.59	0.45
DEPw3 on BARSw2	_____	_____	0.47	0.36	_____	_____	0.33	0.37
Relationship Commitment Paths								
BMIw2 on MQw1	-1.39	1.33	-1.39	1.33	-1.38	1.33	-1.38	1.33
BMIw3 on MQw2	1.20	1.60	1.20	1.60	1.56	1.61	1.56	1.61
Psychological Stress Paths								
DEPw2 on MQw2	**-2.92*** **	0.81	**-2.95*** **	0.83	**-2.92****	0.81	**-2.95*** **	0.83
DEPw3 on MQw3	**-2.42*** **	0.58	**-2.41*** **	0.60	**-2.17****	0.56	**-2.23*** **	0.56
BMIw2 on DEPw2	0.21	0.28	0.21	0.28	0.21	0.28	0.21	0.28
BMIw3 on DEPw3	0.09	0.22	0.09	0.22	-0.03	0.24	-0.03	0.24
BMIw2 on DEPw1	0.24	0.21	0.24	0.21	0.24	0.21	0.24	0.21
BMIw3 on DEPw2	0.06	0.24	0.06	0.24	0.02	0.23	0.02	0.23
DEPw2 on BARS*MQw1	_____	_____	3.65	4.00	_____	_____	3.67	4.00
DEPw3 on BARS*MQw2	_____	_____	1.31	3.09	_____	_____	2.23	2.98
Stability Paths								
MQw2 on MQw1	**0.61*** **	0.08	**0.61*** **	0.08	**0.61*** **	0.08	**0.61*** **	0.08

Table 24. Longitudinal model results with and without barriers and controls by age, continued

MQw3 on MQw2	**0.64*** **	0.10	**0.64*** **	0.10	**0.64*** **	0.10	**0.64*** **	0.10
DEPw2 on DEPw1	**0.37*** **	0.10	**0.37*** **	0.10	**0.37*** **	0.10	**0.37*** **	0.10
DEPw3 on DEPw2	**0.40*** **	0.08	**0.40*** **	0.08	**0.36*** **	0.08	**0.36*** **	0.08
BMIw2 on BMIw1	**0.99*** **	0.04	**0.99*** **	0.04	**0.99*** **	0.04	**0.99*** **	0.04
BMIw3 on BMIw2	**0.97*** **	0.03	**0.97*** **	0.03	**0.95*** **	0.04	**0.95*** **	0.04
BARSw2 on BARSw1	_____	_____	**0.82*** **	0.05	_____	_____	**0.82*** **	0.05
Correlations								
MQw1 with DEPw1	**-0.03*** **	0.01	**-0.04*** **	0.01	**-0.04*** **	0.01	**-0.04*** **	0.01
DEPw1 with BMIw1	0.64	0.38	0.64	0.38	0.64	0.38	0.64	0.38
MQw1 with BMIw1	-0.00	0.04	-0.00	0.04	-0.00	0.04	-0.00	0.04
BARSw1 with MQw1	_____	_____	-0.00	0.00	_____	_____	-0.00	0.00
DEPw1 with BARSw1	_____	_____	0.01	0.01	_____	_____	0.01	0.01
BMIw1 to BARSw1	_____	_____	-0.02	0.04	_____	_____	-0.02	0.04
Controls on Depression (Wave III)								
Sex					0.01	0.09	-0.03	0.10
Minority					0.19	0.14	0.19	0.14
Respondent's health					0.03	0.03	0.03	0.03
Chronic conditions					-0.03	0.08	-0.04	0.08
Functional health					-0.12	0.12	-0.11	0.12
Physical activity					-0.03	0.05	-0.03	0.05
Financial stress					0.10	0.06	0.09	0.06
Controls on Body Mass Index (Wave III)								
Sex					-0.25	0.34	-0.25	0.34
Minority					-0.16	0.43	-0.16	0.43

Table 24. Longitudinal model results with and without barriers and controls by age, continued

Respondent's health					0.09	0.10	0.09	0.10
Chronic conditions					-0.02	0.25	-0.02	0.25
Functional health					0.16	0.57	0.16	0.57
Physical activity					-0.17	0.19	-0.17	0.19
Financial stress					0.40	0.21	0.40	0.21
Means								
BMIw1	24.84**	0.34	24.84**	0.34	24.84**	0.34	24.84**	0.34
DEPw1	-0.06	0.08	-0.06	0.08	-0.06	0.08	-0.06	0.08
MQw1	0.81**	0.01	0.81**	0.01	0.81**	0.01	0.81**	0.01
BARSw1	---------	--------	0.49**	0.01	----------	--------	0.49**	0.01
Intercepts								
BMIw2	2.29	1.56	2.29	1.56	2.29	1.56	2.29	1.56
DEPw2	1.23*	0.49	0.87	0.55	1.23*	0.49	0.87	0.55
MQw2	0.31**	0.07	0.31**	0.07	0.31**	0.07	0.31**	0.07
BMIw3	0.62	1.59	0.62	1.59	0.21	3.29	0.21	3.29
DEPw3	0.49	0.36	0.24	0.38	0.33	0.64	0.17	0.66
MQw3	0.27*	0.09	0.27*	0.09	0.27*	0.09	0.27*	0.09
BARSw2	---------	--------	0.10**	0.02	----------	--------	0.10**	0.02
Variances								
BMIw1	21.52**	4.69	21.52**	4.69	21.52**	4.70	21.52**	4.70
DEPw1	0.85**	0.12	0.85**	0.12	0.85**	0.12	0.85**	0.12
MQw1	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BARSw1	----------	---------	0.02**	0.00	----------	--------	0.02**	0.00
Residuals								
BMIw2	3.45**	0.53	3.45**	0.53	3.45**	0.53	3.45**	0.53
DEPw2	0.58**	0.08	0.57**	0.08	0.58**	0.08	0.57**	0.08
MQw2	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BMIw3	4.74**	0.61	4.74**	0.61	4.56**	0.60	4.56**	0.60
DEPw3	0.37**	0.05	0.36**	0.05	0.35**	0.05	0.35**	0.05
MQw3	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BARSw2	----------	---------	0.01**	0.00	---------	--------	0.01**	0.00
N	241			241		240		240

Table 24. Longitudinal model results with and without barriers and controls by age, continued

Old								
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Marital Protection Paths								
DEPw2 on MQw1	0.37	0.37	0.58	0.67	0.22	0.68	0.43	0.67
DEPw3 on MQw2	**2.28****	0.74	**2.04****	0.71	**1.91*****	0.56	**1.89*****	0.55
DEPw2 on BARSw1	_____	_____	0.79	0.41	_____	_____	0.72	0.41
DEPw3 on BARSw2	_____	_____	0.78	0.45	_____	_____	0.05	0.45
Relationship Commitment Paths								
BMIw2 on MQw1	-0.58	0.88	-0.58	0.88	-0.62	0.89	-0.62	0.89
BMIw3 on MQw2	0.03	1.28	0.03	1.28	0.72	1.29	0.72	1.29
Psychological Stress Paths								
DEPw2 on MQw2	**-2.44*****	0.73	**-2.73*****	0.75	**-2.27****	0.75	**-2.54*****	0.76
DEPw3 on MQw3	**-2.53*****	0.73	**-2.49*****	0.69	**-2.01*****	0.52	**-2.09*****	0.52
BMIw2 on DEPw2	**-0.25***	0.12	**-0.25***	0.12	**-0.27***	0.13	**-0.27***	0.13
BMIw3 on DEPw3	-0.05	0.18	-0.05	0.18	-0.13	0.20	-0.13	0.20
BMIw2 on DEPw1	0.07	0.13	0.07	0.13	0.08	0.13	0.08	0.13
BMIw3 on DEPw2	0.23	0.19	0.23	0.19	0.22	0.18	0.22	0.18
DEPw2 on BARS*MQw1	_____	_____	-3.55	3.07	_____	_____	-3.62	3.06
DEPw3 on BARS*MQw2	_____	_____	-1.41	3.79	_____	_____	-3.06	2.91
Stability Paths								
MQw2 on MQw1	**0.69*****	0.05	**0.69*****	0.05	**0.69*****	0.05	**0.69*****	0.05
MQw3 on MQw2	**0.77*****	0.07	**0.77*****	0.07	**0.77*****	0.07	**0.77*****	0.07
DEPw2 on DEPw1	**0.35*****	0.08	**0.33*****	0.08	**0.36*****	0.08	**0.34*****	0.08

Table 24. Longitudinal model results with and without barriers and controls by age, continued

DEPw3 on DEPw2	**0.43*** **	0.08	**0.40*** **	0.08	**0.33*** **	0.07	**0.33*** **	0.07
BMIw2 on BMIw1	**0.93*** **	0.03	**0.93*** **	0.03	**0.93*** **	0.03	**0.93*** **	0.03
BMIw3 on BMIw2	**1.02*** **	0.05	**1.02*** **	0.05	**1.01*** **	0.05	**1.01*** **	0.05
BARSw2 on BARSw1	_____	_____	**0.84*** **	0.04	_____	_____	**0.84*** **	0.04
Correlations								
MQw1 with DEPw1	**-0.04*** **	0.01	**-0.04*** **	0.01	**-0.04*** **	0.01	**-0.04*** **	0.01
DEPw1 with BMIw1	-0.26	0.29	-0.26	0.29	-0.26	0.29	-0.26	0.29
MQw1 with BMIw1	0.00	0.04	0.00	0.04	0.00	0.04	0.00	0.04
BARSw1 with MQw1	_____	_____	-0.00	0.00	_____	_____	-0.00	0.00
DEPw1 with BARSw1	_____	_____	**0.02***	0.01	_____	_____	**0.02****	0.01
BMIw1 to BARSw1	_____	_____	0.04	0.04	_____	_____	0.04	0.04
Controls on Depression (Wave III)								
Sex					0.11	0.10	0.10	0.11
Minority					0.23	0.13	0.23	0.14
Respondent's health					**0.11*** **	0.03	**0.11*** **	0.03
Chronic conditions					0.03	0.07	0.03	0.07
Functional health					**-0.22***	0.11	**-0.22***	0.11
Physical activity					-0.07	0.06	-0.08	0.06
Financial stress					0.05	0.07	0.06	0.07
Controls on Body Mass Index (Wave III)								
Sex					0.46	0.30	0.46	0.30
Minority					-0.63	0.36	-0.63	0.36
Respondent's health					0.10	0.09	0.10	0.09
Chronic conditions					-0.06	0.22	-0.06	0.22

Table 24. Longitudinal model results with and without barriers and controls by age, continued

Functional health					0.16	0.22	0.16	0.22
Physical activity					-0.01	0.20	-0.01	0.20
Financial stress					0.19	0.20	0.19	0.20
Means								
BMIw1	25.97**	0.33	25.97**	0.33	25.96**	0.33	25.96**	0.33
DEPw1	-0.09	0.07	-0.09	0.07	-0.08	0.07	-0.08	0.07
MQw1	0.82**	0.01	0.82**	0.01	0.82**	0.01	0.82**	0.01
BARSw1	---------	--------	0.53**	0.01	----------	--------	0.53**	0.01
Intercepts								
BMIw2	2.73*	1.07	2.73*	1.07	2.77*	1.08	2.77*	1.08
DEPw2	1.48*	0.48	1.11*	0.52	1.45*	0.49	1.11*	0.52
MQw2	0.24**	0.04	0.24**	0.04	0.24**	0.04	0.24**	0.04
BMIw3	0.34	1.61	0.33	1.61	-1.30	2.29	-1.30	2.29
DEPw3	-0.10	0.45	-0.33	0.48	-0.49	0.65	-0.43	0.64
MQw3	0.16*	0.06	0.16*	0.06	0.16*	0.06	0.16*	0.06
BARSw2	---------	--------	0.06*	0.02	----------	--------	0.06*	0.02
Variances								
BMIw1	20.99**	2.92	20.99**	2.92	21.17**	2.95	21.17**	2.95
DEPw1	0.92**	0.10	0.92**	0.10	0.92**	0.10	0.92**	0.10
MQw1	0.02**	0.00	0.02**	0.00	0.02**	0.00	0.02**	0.00
BARSw1	----------	---------	0.02**	0.00	----------	--------	0.02**	0.00
Residuals								
BMIw2	2.43**	0.38	2.43**	0.38	2.45**	0.38	2.45**	0.38
DEPw2	0.59**	0.09	0.58**	0.09	0.58**	0.09	0.57**	0.09
MQw2	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BMIw3	3.90**	0.53	3.90**	0.53	3.74**	0.48	3.74**	0.48
DEPw3	0.59**	0.08	0.58**	0.08	0.44**	0.05	0.44**	0.05
MQw3	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BARSw2	----------	---------	0.00**	0.00	---------	--------	0.00**	0.00
N	224		224		222		222	
Tests of Model Fit								
Chi Square								
Value	142.00		240.00		389.39		618.30	
df	34		100		132		226	
p value	0.00		0.00		0.00		0.00	
CFI	0.94		0.94		0.89		0.86	

Table 24. Longitudinal model results with and without barriers and controls by age, continued

TLI	0.88	0.90	0.83	0.81
RMSEA	0.12	0.08	0.09	0.09
SRMR	0.07	0.08	0.11	0.11

* $p < .05$; ** $p < .01$; $p < .001$

Tests by sex. Table 25 below shows model results with and without barriers and controls by sex. Once again, as the model results are relatively parallel for all 4 model runs, only the model with barriers and controls will be described in detail below.

Stability path hypotheses (LONG1 to LONG3) are all supported for both males and females. Marital quality is positively related to itself over time (MLR estimates for males is .62 Wave I to II and .66 Wave II to III, $p < .001$; for females is .67, Wave I to II and .74, Wave II to III, $p < .001$). Depression is also related over time (MLR estimates for males is .30 Wave I to II and .41 Wave II to III, $p < .001$; for females is .37 Wave I to II and .24 Wave II to III, $p < .001$). BMI is related over time (MLR estimates for males: 1.01 and 1.03, $p < .001$ Wave I to II and Wave II to III respectively; for females: .92 and .93, $p < .001$ Wave I to II and Wave II to III respectively). Finally, barriers are also related over time for both groups (MLR estimates are .83, $p < .001$ Wave I to II for males and .73, $p < .001$ Wave I to II for females).

The marital protection hypothesis (MPROT1) is partially supported for both groups. Marital quality at Wave I has no significant effect on depression at Wave II but marital quality at Wave II does have a positive relationship with depression at Wave III (MLR estimate is 1.90, $p < .001$ for males and 1.84, $p < .01$ for females) indicating the

effect is slightly stronger for males. However, as with the overall model, this effect is in the opposite direction than predicted.

The relationship commitment hypothesis (RCOMM1) is not supported. Marital quality does not affect BMI over time. Psychological stress hypothesis 1a (PSYSTRESS1a) is supported for both groups. Marital quality at Wave II is negatively related to depression at Wave II (for males MLR estimate is -2.27, $p < .001$; for females: -3.21, $p < .001$). Marital quality at Wave III is also negatively related to depression at Wave III (MLR estimate for males: -1.60, $p < .001$; females: -2.40, $p < .001$). Note the estimates are stronger for females than for males. For the males, depression at Wave II is negatively related to BMI at Wave II (hypothesis PSYSTRESS1b) (MLR estimate is -.41, $p < .001$) and has a similar effect at Wave III (MLR estimate is -.45, $p < .001$). This effect is also in the opposite direction than predicted – depression is decreasing BMI. Hypothesis PSYSTRESS2 is partially supported for males. Depression at Wave II was positively related to BMI at Wave III (MLR estimate is .64, $p < .001$) but this effect did not occur for depression at Wave I to BMI at Wave II.

There is little support for MODEFF1 for males. Barriers at Wave I is positively related to depression at Wave II (MLR estimate is 1.67, $p < .01$) but barriers at Wave II is not related to depression at Wave III. The interaction between marital quality and barriers is significant for males (MLR estimate for the interaction at Wave II on depression at Wave III is .7.48, $p < .05$). However, this effect is in the opposite direction than predicted.

None of the control variables are significantly related to depression or BMI for males. For females, respondent's health is positively related to depression (MLR estimate is .11, $p < .001$) and financial stress is positively related to depression (MLR estimate is .23, $p < .001$). Financial stress was also positively related to BMI for females (MLR estimate is .54, $p < .01$).

Once again, the models did not meet fit criteria with or without the inclusion of barriers or controls on the model. For example, for the model with barriers and controls included, χ^2 (226) = 746.06, $p = .00$, RMSEA = .10, CFI = .82, TLI = .75, and SRMR = .12.

Table 25. Longitudinal model results with and without barriers and controls by sex

Unstandardized Parameter Estimates								
	Without controls and barriers		Without controls with barriers		With controls without barriers		With controls and with barriers	
Male								
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Marital Protection Paths								
DEPw2 on MQw1	0.52	0.81	0.10	0.88	0.40	0.82	-0.05	0.89
DEPw3 on MQw2	**1.50****	0.54	**2.16*****	0.61	**1.38****	0.51	**1.90*****	0.56
DEPw2 on BARSw1	_____	_____	**1.78****	0.61	_____	_____	**1.67****	0.62
DEPw3 on BARSw2	_____	_____	0.30	0.41	_____	_____	-0.03	0.39
Relationship Commitment Paths								
BMIw2 on MQw1	0.00	1.10	0.00	1.10	-0.02	1.11	-0.02	1.11
BMIw3 on MQw2	0.48	1.30	0.49	1.30	0.71	1.33	0.71	1.33
Psychological Stress Paths								
DEPw2 on MQw2	**-2.21*****	0.61	**-2.43*****	0.60	**-2.07*****	0.61	**-2.27*****	0.61
DEPw3 on MQw3	**-1.59*****	0.49	**-1.58*****	0.47	**-1.67*****	0.47	**-1.60*****	0.46
BMIw2 on DEPw2	**-0.39*****	0.12	**-0.39*****	0.12	**-0.41*****	0.12	**-0.41*****	0.12
BMIw3 on DEPw3	**-0.53****	0.19	**-0.52****	0.19	**-0.45***	0.20	**-0.45***	0.20
BMIw2 on DEPw1	0.23	0.14	0.23	0.14	0.25	0.14	0.25	0.14
BMIw3 on DEPw2	**0.65*****	0.18	**0.65****	0.18	**0.64*****	0.18	**0.64*****	0.18
DEPw2 on BARS*MQw1	_____	_____	-7.26	6.56	_____	_____	-7.78	6.62
DEPw3 on BARS*MQw2	_____	_____	**9.73****	3.31	_____	_____	**7.48***	3.13
Stability Paths								
MQw2 on MQw1	**0.62*****	0.08	**0.62*****	0.08	**0.62*****	0.08	**0.62*****	0.08
MQw3 on MQw2	**0.66*****	0.08	**0.66*****	0.08	**0.66*****	0.08	**0.66*****	0.08

Table 25. Longitudinal model results with and without barriers and controls by sex, continued

DEPw2 on DEPw1	**0.31*** **	0.09	**0.29*** **	0.09	**0.32*** **	0.09	**0.30*** **	0.09
DEPw3 on DEPw2	**0.47*** **	0.08	**0.46*** **	0.08	**0.41*** **	0.08	**0.41*** **	0.08
BMIw2 on BMIw1	**1.01*** **	0.03	**1.01*** **	0.03	**1.01*** **	0.03	**1.01*** **	0.03
BMIw3 on BMIw2	**1.03*** **	0.04	**1.03*** **	0.04	**1.03** **	0.04	**1.03*** **	0.04
BARSw2 on BARSw1	_____	_____	**0.82*** **	0.05	_____	_____	**0.83*** **	0.06
Correlations								
MQw1 with DEPw1	**-0.03** **	0.01	**-0.03** **	0.01	**-0.03** **	0.01	**-0.03** **	0.01
DEPw1 with BMIw1	0.30	0.36	0.30	0.36	0.30	0.37	0.30	0.37
MQw1 with BMIw1	-0.04	0.04	-0.04	0.04	-0.04	0.04	-0.04	0.04
BARSw1 with MQw1	_____	_____	0.00	0.00	_____	_____	0.00	0.00
DEPw1 with BARSw1	_____	_____	0.01	0.01	_____	_____	0.01	0.01
BMIw1 to BARSw1	_____	_____	0.06	0.03	_____	_____	0.06	0.03
Controls on Depression (Wave III)								
Age					-0.00	0.01	-0.01	0.01
Minority					**0.26***	0.13	0.23	0.13
Respondent's health					0.04	0.03	0.03	0.03
Chronic conditions					0.10	0.07	0.11	0.07
Functional health					-0.20	0.15	-0.19	0.15
Physical activity					-0.01	0.05	-0.02	0.05
Financial stress					-0.03	0.06	-0.02	0.06
Controls on Body Mass Index								
Age					-0.00	0.03	-0.00	0.03
Minority					-0.50	0.35	-0.50	0.35
Respondent's health					0.15	0.09	0.15	0.09

Table 25. Longitudinal model results with and without barriers and controls by sex, continued

Chronic conditions					-0.25	0.22	-0.25	0.22
Functional health					0.22	0.23	0.22	0.23
Physical activity					0.11	0.21	0.11	0.21
Financial stress					0.03	0.19	0.03	0.19
Means								
BMIw1	26.44**	0.34	26.44**	0.34	26.43**	0.35	26.43**	0.35
DEPw1	-0.20*	0.07	-0.20*	0.07	-0.19*	0.07	-0.19*	0.07
MQw1	0.83**	0.01	0.83**	0.01	0.83**	0.01	0.83**	0.01
BARSw1	---	---	0.46**	0.01	---	---	0.46**	0.01
Intercepts								
BMIw2	0.32	1.35	0.32	1.35	0.35	1.35	0.35	1.35
DEPw2	1.13*	0.50	0.82	0.57	1.10*	0.50	0.86	0.57
MQw2	0.30**	0.07	0.30**	0.07	0.30**	0.07	0.30**	0.07
BMIw3	-0.61	1.72	-0.61	1.72	-1.64	2.89	-1.64	2.89
DEPw3	-0.27	0.32	-0.95*	0.45	0.17	0.82	-0.13	0.82
MQw3	0.27**	0.07	0.27**	0.07	0.27**	0.07	0.27**	0.07
BARSw2	---	---	0.07*	0.02	---	---	0.07*	0.02
Variances								
BMIw1	19.20**	3.98	19.20**	3.98	19.37**	4.03	19.37**	4.03
DEPw1	0.67**	0.08	0.67**	0.08	0.68**	0.08	0.68**	0.08
MQw1	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BARSw1	---	---	0.01**	0.00	---	---	0.01**	0.00
Residuals								
BMIw2	1.86**	0.27	1.86**	0.27	1.87**	0.27	1.87**	0.27
DEPw2	0.55**	0.09	0.52**	0.08	0.54**	0.09	0.51**	0.08
MQw2	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BMIw3	3.66**	0.47	3.66**	0.47	3.52**	0.42	3.52**	0.42
DEPw3	0.37**	0.06	0.35**	0.05	0.32**	0.04	0.31**	0.04
MQw3	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BARSw2	---	---	0.00**	0.00	---	---	0.00**	0.00
N		218		218		215		215
Female								
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Marital Protection Paths								

Table 25. Longitudinal model results with and without barriers and controls by sex, continued

DEPw2 on MQw1	1.03	0.66	0.95	0.73	1.03	0.66	0.95	0.73
DEPw3 on MQw2	**1.96****	0.75	**1.99****	0.77	**1.73****	0.66	**1.84****	0.68
DEPw2 on BARSw1	_____	_____	0.28	0.44	_____	_____	0.28	0.44
DEPw3 on BARSw2	_____	_____	**0.84***	0.43	_____	_____	0.26	0.39
Relationship Commitment Paths								
BMIw2 on MQw1	-1.30	1.30	-1.30	1.30	-1.30	1.30	-1.30	1.30
BMIw3 on MQw2	0.90	1.45	0.90	1.45	1.38	1.39	1.38	1.39
Psychological Stress Paths								
DEPw2 on MQw2	**-3.18*****	0.89	**-3.21*****	0.90	**-3.18*****	0.89	**-3.21*****	0.90
DEPw3 on MQw3	**-3.24*****	0.70	**-3.17*****	0.70	**-2.40*****	0.61	**-2.40*****	0.61
BMIw2 on DEPw2	0.34	0.28	0.34	0.28	0.34	0.28	0.34	0.28
BMIw3 on DEPw3	0.29	0.18	0.29	0.18	0.09	0.21	0.09	0.21
BMIw2 on DEPw1	0.06	0.17	0.06	0.17	0.06	0.17	0.06	0.17
BMIw3 on DEPw2	-0.16	0.22	-0.16	0.22	-0.18	0.21	-0.18	0.21
DEPw2 on BARS*MQw1	_____	_____	1.35	3.05	_____	_____	1.35	3.05
DEPw3 on BARS*MQw2	_____	_____	-4.85	3.80	_____	_____	-3.69	3.37
Stability Paths								
MQw2 on MQw1	**0.67*****	0.06	**0.67*****	0.06	**0.67*****	0.06	**0.67*****	0.06
MQw3 on MQw2	**0.74*****	0.08	**0.74*****	0.08	**0.74*****	0.08	**0.74*****	0.08
DEPw2 on DEPw1	**0.38*****	0.08	**0.37*****	0.08	**0.38*****	0.08	**0.37*****	0.08
DEPw3 on DEPw2	**0.34*****	0.07	**0.32*****	0.07	**0.24*****	0.06	**0.24*****	0.06
BMIw2 on BMIw1	**0.92*****	0.03	**0.92*****	0.03	**0.92*****	0.03	**0.92*****	0.03

Table 25. Longitudinal model results with and without barriers and controls by sex, continued

BMIw3 on BMIw2	**0.96*** **	0.03	**0.96*** **	0.03	**0.93*** **	0.04	**0.93*** **	0.04
BARSw2 on BARSw1	_____	_____	**0.73*** **	0.05	_____	_____	**0.73*** **	0.05
Correlations								
MQw1 with DEPw1	**-0.05*** **	0.01	**-0.05*** **	0.01	**-0.05*** **	0.01	**-0.05*** **	0.01
DEPw1 with BMIw1	0.40	0.28	0.40	0.28	0.40	0.28	0.40	0.28
MQw1 with BMIw1	0.02	0.04	0.02	0.04	0.02	0.04	0.02	0.04
BARSw1 with MQw1	_____	_____	0.00	0.00	_____	_____	0.00	0.00
DEPw1 with BARSw1	_____	_____	0.01	0.01	_____	_____	0.01	0.01
BMIw1 to BARSw1	_____	_____	**0.10** **	0.04	_____	_____	**0.10** **	0.04
Controls on Depression (Wave III)								
Age					0.01	0.01	0.01	0.01
Minority					0.15	0.14	0.13	0.13
Respondent's health					**0.12*** **	0.03	**0.11*** **	0.03
Chronic conditions					-0.08	0.08	-0.08	0.07
Functional health					-0.20	0.11	-0.20	0.11
Physical activity					-0.04	0.05	-0.06	0.05
Financial stress					**0.23*** **	0.07	**0.23*** **	0.07
Controls on Body Mass Index (Wave III)								
Age					0.02	0.03	0.02	0.03
Minority					-0.14	0.41	-0.14	0.41
Respondent's health					0.04	0.09	0.04	0.09
Chronic conditions					0.28	0.22	0.28	0.22
Functional health					0.13	0.37	0.13	0.37
Physical activity					-0.22	0.18	-0.22	0.18

Table 25. Longitudinal model results with and without barriers and controls by sex, continued

Financial stress					**0.54****	0.19	**0.54****	0.19
Means								
BMIw1	24.25**	0.31	24.25**	0.31	24.25**	0.31	24.25**	0.31
DEPw1	0.06	0.08	0.06	0.08	0.06	0.08	0.06	0.08
MQw1	0.80**	0.01	0.80**	0.01	0.80**	0.01	0.80**	0.01
BARSw1	---------	--------	0.56**	0.01	----------	--------	0.56**	0.01
Intercepts								
BMIw2	3.84*	1.34	3.84*	1.34	3.84*	1.34	3.84*	1.34
DEPw2	1.56**	0.48	1.48*	0.57	1.56**	0.48	1.48*	0.57
MQw2	0.25**	0.05	0.25**	0.05	0.25**	0.05	0.25**	0.05
BMIw3	1.17	1.33	1.17	1.33	-0.20	2.34	-0.20	2.34
DEPw3	0.66	0.45	0.13	0.49	-0.13	0.71	-0.31	0.73
MQw3	0.18*	0.07	0.18*	0.07	0.18*	0.07	0.18*	0.07
BARSw2	---------	--------	0.14**	0.03	----------	--------	0.14**	0.03
Variances								
BMIw1	21.65**	3.41	21.65**	3.41	21.65**	3.41	21.65**	3.41
DEPw1	1.07**	0.13	1.07**	0.13	1.07**	0.13	1.07**	0.13
MQw1	0.02**	0.00	0.02**	0.00	0.02	0.00	0.02**	0.00
BARSw1	----------	---------	0.02**	0.00	----------	--------	0.02**	0.00
Residuals								
BMIw2	4.10**	0.62	4.10**	0.62	4.10**	0.62	4.10**	0.62
DEPw2	0.62**	0.08	0.62**	0.08	0.62**	0.08	0.62**	0.08
MQw2	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BMIw3	4.80**	0.66	4.80**	0.67	4.51**	0.61	4.51**	0.61
DEPw3	0.57**	0.07	0.55**	0.07	0.44**	0.05	0.44**	0.05
MQw3	0.01**	0.00	0.01**	0.00	0.01**	0.00	0.01**	0.00
BARSw2	----------	---------	0.01**	0.00	---------	--------	0.01**	0.00
N		247		247		247		247
Tests of Model Fit								
Chi Square								
Value		168.22		413.93		377.86		746.06
df		34		100		132		226
p value		0.00		0.00		0.00		0.00
CFI		0.93		0.87		0.89		0.82
TLI		0.85		0.80		0.84		0.75
RMSEA		0.13		0.12		0.09		0.10
SRMR		0.08		0.13		0.11		0.12

* $p < .05$; ** $p < .01$; $p < .001$

CHAPTER 4: DISCUSSION AND CONCLUSIONS

Summary and Discussion of Main Findings

Despite being linked to many health benefits, marriage is known to be related to weight gain and obesity (e.g. Hedblad et al., 2002; Lipowicz, Gronkiewicz, & Malina, 2002; Sobal, Rauschenback, & Frongillo, 2003). Those who have studied physical health outcomes of marriage have taken three different approaches: 1) analysing selection effects, 2) investigating protection effects, and 3) focusing on the quality of the marital interaction. The focus of this research was to examine this last approach. It was hypothesized that depression would mediate the link between marital quality and weight (psychological stress path) with barriers to leaving moderating this effect of marital quality on depression. It was also hypothesized that marital quality would protect one from depression over time (marital protection path) and that high marital quality would decrease the need to maintain weight for entrance into the marriage market (relationship commitment path) thereby increasing weight over time. Results were expected to differ for the young compared to the old and for males compared to females as re-entering the marriage market may be more viable for the young than for the old and the emphasis on beauty is stronger for females than for males (Heaton & Albrecht, 1991).

Concurrent Analyses

Cross-sectional analyses at each wave show that marital quality is negatively related to depression and barriers to leaving are positively related to depression as predicted (see Figure 1). At Wave III, barriers moderated the relationship between marital quality and depression where high marital quality decreases depression when

barriers are low and when barriers are high low marital quality has a stronger effect on depression. Depression did not, however, have an effect on weight. This is consistent with the National Center for Health Statistics (2006) study where cross sectional evidence for the link between depression and body mass index was weak. Marital quality also, had no direct effect on weight. Therefore, depression did not mediate the relationship between marital quality and weight as there was no direct link to weight from marital quality in this study at any of the three waves examined.

With the inclusion of controls, model fit decreased and the effect of barriers only remained at Wave III. Significant controls on depression were minority status and respondent's health at all waves. In other words, non-whites and those in poor health were more likely to be depressed than whites and individuals in good health. Physical activity was negatively related to depression only at Wave II. Age was positively related to BMI as was respondent's health at all waves. Number of chronic conditions (Waves I and II only) was positively related to BMI. Sex was negatively related to BMI meaning men were more likely to have a higher body mass index than women. Financial stress was positively related to BMI at Wave III only.

When examining cross-sectional findings by age, marital quality was negatively related to depression for both the young and old groups at all waves. Barriers were positively related to depression for the young only at Wave III but were significant at all waves for the older group. Barriers moderated the effect of marital quality on depression only at Wave III for both groups but the effect was stronger for the younger group. Thus, by Wave III high barriers strengthened the effect of low marital quality on depression for

both groups but was more pronounced for the younger group. Keep in mind the sample selected for this study was not 'old' per say. Individuals were between the ages of 24 and 44 at Wave I and aged 8 years over the course of the three waves. Individuals tend to accumulate more barriers the longer they are married, so it is not surprising that barriers had an effect for the older group at all waves. Descriptives also show that mean barriers increased slightly over the three waves for all individuals. What is interesting is that the interaction between marital quality and barriers was stronger for the young. Thus, younger individuals in low quality marriages with high barriers are more negatively affected than older individuals. Perhaps, it is non-normative to feel 'stuck' early in life, where it may become more normative to feel this way as one approaches mid-life.

With the inclusion of controls, model fit decreased slightly but generally still met fit criteria. Marital quality continued to be negatively related to depression for both groups. Barriers were positively related to depression only for the young at Wave III however barriers moderated the relationship between marital quality and depression at Wave III for both groups. For the young, controls had little effect on depression (minority status was positively related to depression only at Wave I; respondent's health was positively related to depression only at Wave II). Controls also were not consistently related throughout the waves for the older group (minority status was positively related at Waves I and III, respondent's health was positively related at Wave I and III, number of chronic conditions and financial stress were positively related to depression only at Wave II, functional health was negatively related to depression only at Wave II, and physical activity was negatively related to depression only at Wave I).

Depression was negatively related to weight only at Wave II for the older group. For the young, sex was consistently negatively related to weight at all waves meaning males had higher BMI levels than females. Respondent's health was positively related to weight at Waves II and III and physical activity was negatively related to weight at Wave III only. For the older group, sex was also consistently negatively related to weight at all waves. Other controls were inconsistent (respondent's health was positively related to weight at Waves I and II; number of chronic conditions and functional health were positively related to weight at Wave II only; physical actively was negatively related to weight at Wave I only). Aside from sex being related to BMI, when examining controls by age group, they did not have a large impact on depression or BMI.

Cross sectional finding by sex, show that marital quality was negatively related to depression at all waves for both men and women. Barriers were positively related to depression for men at Wave III only and barriers moderated the effect of marital quality on depression for both groups at Wave III only where high barriers strengthened the effect of low marital quality on depression. This effect was stronger for women than for men. This is consistent with other research showing the quality of marriage is more important to women than men (e.g. Levenson et al., 1993; Prigerson et al., 1999) in terms of mental health. Depression was positively related to weight at Wave II only for women. Note, models did not achieve fit criteria at Waves I or III.

With the addition of controls, the effects of marital quality, barriers and the interaction of barriers and marital quality remained. Depression was no longer related to weight for women at Wave II but was now related to weight for men at Wave II. Control

effects on depression were inconsistent across waves for men (minority status and respondent's health were positively related to depression at Wave I only; physical activity was negatively related to depression and financial stress was positively related to depression at Wave II only). For women, respondent's health was consistently positively related to depression at all waves. Financial stress was only positively related to depression at Wave III. Respondent's health was positively related to weight for men at Waves II and III. Age and number of chronic conditions was also positively related to weight for men at Wave I only. For women, age was positively related to weight at Wave I only, respondent's health was positively related to weight at Waves I and II, number of chronic conditions was positively related to weight at Waves II and III, and financial stress was positively related to weight at Wave III only. Models did not achieve fit criteria at Waves I or III. Once again, the control variables did not appear to have consistent effects on depression or BMI across the three waves of data.

Based on these cross sectional analyses, there is clear support that marital quality affects levels of depression. Barriers to leaving contribute to feelings of depression but this generally does not occur until Wave III or for older individuals (along with the marital quality-barrier interaction). This is likely because it takes time to accumulate enough barriers to feel 'stuck' enough for barriers to have an impact on mental health. Depression did not have an effect on weight in the cross sectional models (very limited and inconsistent support for this link).

Longitudinal Analyses

As would be expected, the level of marital quality, barriers, depression and weight over time was highly stable (stability paths supported). Psychological stress paths were partially supported. Marital quality was concurrently negatively related to depression as predicted (marital quality at Wave II was negatively related to depression at Wave II; marital quality at Wave III was negatively related to depression at Wave III) with or without the inclusion of barriers and controls in the model. There was no interaction effect of marital quality and barriers on depression over time. Depression was not related to weigh concurrently or over time. This is inconsistent with Blaine's (2008) meta-analysis that found 18 out of 23 samples reporting a significant positive relationship between depression and weight. Relationship commitment paths were not supported – marital quality did not have an effect on weight over time. Marital protection paths were partially supported however not always as expected. Marital quality at Wave II was positively related to depression at Wave III (with or without barriers and controls). (Marital quality at Wave I however was not significantly related to depression at Wave II). This effect is in the opposite direction than predicted. It is possible however, that a suppressor effect may be occurring as each effect found is controlling for all other paths and correlations in the model. Since the concurrent effects of marital quality on depression show a negative relationship, it could be that these effects are suppressing the longitudinal effects and changing the direction of the effect (MacKinnon, Krull, & Lockwood, 2000). When barriers were included in the model, barriers at Wave I had a positive effect on depression at Wave II, this relationship held for barriers at Wave II on

depression at Wave III only when there were no controls in the model. Significant controls on depression include minority status (positively related), respondent's health (positively related) and functional health (negatively related). Financial stress (positively related) was the only control that had a significant effect on weight. None of the models (with/without barriers and controls) met fit criteria but models without controls did have better fit.

When examining the models by age, stability paths were once again highly related for both the young and old groups. Psychological stress paths were once again only partially supported. For the young, marital quality was negatively related to depression concurrently (marital quality at Wave II was negatively related to depression at Wave II; marital quality at Wave III was negatively related to depression at Wave III). This was also true for the older group. However, for the older group, depression at Wave II was negatively related to weight at Wave II – high levels of depression decreased weight. This did not hold over to Wave III and was in the opposite direction than predicted. Relationship commitment paths were non-significant for both groups. Once again, there was partial support for the marital protection paths (marital quality at Wave II was positively related to depression at Wave III for both groups and the effect was stronger for the older group). This too was in the opposite direction that hypothesized indicating a potential suppressor effect. None of the controls were significant for the young while respondent's health was positively related to depression and functional health was negatively related to depression for the older group. There were no significant controls for either group on weight.

When examining models by sex, stability paths were once again supported for both males and females. The marital protection hypothesis was partially supported for both groups. Marital quality at Wave I had no significant effect on depression at Wave II but marital quality at Wave II did have a positive relationship with depression at Wave III. The effect was slightly stronger for males. However, as with the overall model, this effect was in the opposite direction than predicted. The relationship commitment hypothesis was not supported. Marital quality did not affect weight over time. There was partial support for the psychological stress hypotheses as marital quality at Wave II was negatively related to depression at Wave II and marital quality at Wave III was also negatively related to depression at Wave III. The estimates were stronger for females than for males. For the males, depression at Wave II was negatively related to weight at Wave II and had a similar effect at Wave III. This effect however was also in the opposite direction than predicted – suggesting there may be a potential suppressor effect occurring. Depression at Wave II was positively related to weight at Wave III for males but this effect did not occur for depression at Wave I to weight at Wave II.

Barriers had little effect over time. Barriers at Wave I were positively related to depression at Wave II but barriers at Wave II were not related to depression at Wave III. The interaction between marital quality and barriers was significant for males (Wave II to III). However, this effect was also in the opposite direction than predicted. None of the control variables were significantly related to depression or weight for males. For females, respondent's health and financial stress was positively related to depression.

Financial stress was also positively related to weight for females only. The models did not meet fit criteria with or without the inclusion of barriers or controls in the model.

In general, marital quality was linked to depression in the longitudinal models. Barriers (and the interaction of barriers with marital quality) had a minor effect on depression. Depression was not consistently linked to weight. Aside from stability paths, the concurrent portions of the model tended to support stated hypothesis. The longitudinal portions when significant, often had effects in the opposite direction than expected (some that don't make intuitive sense – e.g. marital quality causing depression over time) suggesting the potential for a suppressor effect occurring. The results may also be due to poor model fit in these longitudinal models.

Limitations of the Study

One of the main limitations of this study is tied to the limitations inherent in using marital quality as an independent variable in marital research. As divorce rates are at an historic high (National Center for Health Statistics, 2009) marriages that are of low quality are much more likely to dissolve than continue on in a negative state. As the psychological stress path proposed in this study states that low quality marriages will increase depression (and thus emotional eating) which in turn will cause weight gain, it is essential that marriages of low quality are included in the sample. As those who have poor quality marriages tend to separate or divorce, very poor quality marriages are less likely to be included in a sample of married individuals followed over time. In addition, as the sample in this study was restricted to continuous marriages, the chance of including poor quality marriages in this sample is very low as it is highly probable that

these individuals did not remain married over the eight year follow-up. As can be seen by the descriptive statistics, mean marital quality for this sample is on the high end (0.81, 0.80, and 0.79 out of a maximum of 1.00 for Waves I to III respectively) limiting the ability to test the psychological stress path proposed.

Sample selection and the examination of marital quality rather than marital transitions may have seriously limited the ability to test for changes in weight over time. The sample was based on continuous marriages over the three waves in order to determine the effects of marital quality and barriers to leaving. However, individuals at Wave I were not necessarily newlyweds. In fact descriptives show that the mean number of years married at Wave I for this sample was 11.92 years (SD = 6.52). As suggested by Jeffrey and Rick (2002), Williams and Umberson (2004), and Umberson et al. (2009) with regards to weight gain or loss, the transition periods in and out of marriage may be where the majority of weight change is occurring rather than due to changes in the quality of the marriage. Many of the individuals in this sample may have already gained their weight following the transition into marriage and thus further weight gain would be minimal. The data may be left truncated where the individuals are observed *after* the risk of experiencing an event (in this case weight gain) has occurred (Breen, 1996). Once again, looking at the descriptive statistics, mean BMI for this sample does increase over time (25.58, 26.30, 27.12 for Waves I to III respectively) but only slightly. The high stability coefficients for BMI (0.97, $p < .001$ Wave I to Wave II; 0.98, $p < .001$ Wave II to Wave III) show that there is relatively no variation left in the weight measure to be predicted by other variables beyond BMI itself. Furthermore, as only continuous

marriages were included, weight changes due to transitions out of the marriage could not be observed.

The available measures also pose limitations for this study. This is always an issue when using secondary data sources. Initially, separate dimensions of positive and negative marital quality were to be examined as suggested by (Fincham et al., 1997) as positive marital quality more directly relates to the relationship commitment path while negative marital quality more directly relates to the psychological stress path. Empirically, separate dimensions for positive and negative marital quality have been established (Fincham et al., 1997; Fincham & Linfield, 1997; Gable et al., 2003; Huston & Vangelisti, 1991). The marital quality measures available at all three waves in the ACL survey were highly correlated with one another resulting in high alpha values for the scale at all three waves (alpha = .81, .81, .82 Waves I-III respectively). Thus, separate dimensions were not warranted. However, Kouvonen et al. (2011) found that negative aspects of close relationships were positively related to increases in BMI over time. Therefore, it may be important to examine separate dimensions of marital quality as they relate to changes in weight despite high correlations between the positive and negative items. As suggested by the marital commitment and psychological stress hypotheses, positive and negative components of marital quality may affect weight in different ways and should be treated as conceptually distinct.

The barrier measure also needs to be carefully considered. Based on prior research using this measure, the barrier measure in this study could be strengthened with

the inclusion of more psychological barriers (thinking one is 'stuck' in the marriage). The available barrier measures in the ACL survey were largely structural (with the exception of religiosity). Knoester and Booth (2000) found that objective measures of barriers were more effective than perceived barriers at preventing subsequent divorce but in the case of weight gain, it may be more important to *feel* stuck than to *be* stuck. Asking directly about one's level of commitment to the marriage (e.g. how likely are you to break up?) and the constraints they feel would allow for a better test of the relationship commitment path (suggesting those with high marital quality and high commitment to the marriage would be less concerned about maintaining a trim figure as they would not be preparing to re-enter the marriage market). Similarly, the psychological stress path would suggest that feeling 'stuck' in the marriage may cause depression to increase (which in turn would cause subsequent weight gain). However, as the application of barriers in this study is to determine effects on weight, careful consideration of the barrier measure is needed. Perhaps, barriers to leaving the marriage that predict marital stability (as used in prior research) may not be the same as those that predict changes in weight. Specifically, barrier measures should not reflect marital stress if marital quality is a predictor in the model (e.g. lack of income and/or assets may be a marital stressor and thus should not be included in the measurement of barriers). In addition, overweight/obesity may itself be a barrier to leaving a marriage.

What is clearly needed in a study of weight are specific measures of eating behavior. In this study, to test the psychological stress path, it would be useful to have a measure of emotional eating. In this way it could be determined if low marital quality

causes emotional eating to increase causing subsequent weight gain. The path tested in this study was an indirect test of this idea. It would also be important to have a measure of social eating to determine if in fact individuals in happy marriages are more likely to eat socially and be less concerned with maintaining their appearance (relationship commitment path). Additionally, control variables could be strengthened. Perhaps, respondent's health, number of chronic conditions, and functional health measures should have been combined to form a stronger measure of heath. A better (perhaps objective) measure of exercise performed would also be useful in a study on weight.

Finally, the sample was not large enough to adequately estimate all of the parameters in the longitudinal model (especially when examined by age and sex). Rather than limiting the sample to young/middle aged adults, it may be prudent to examine weight changes over the life course and adjust for the curvilinear nature of this trajectory by including an age-squared term in the model.

Strengths of the Study

This study does have some important strengths to consider. First, despite limitations with secondary data, the data do come from a national representative dataset of the US population making the results generalizable to the US population. The dataset also was longitudinal in nature allowing for the assessment of longitudinal paths.

I believe the theory proposed also has merit. It builds upon Riessman and Gerstel's (1985) stress buffering and social strain hypotheses proposed for the relationship between marital status and health. These ideas have been expanded to examine the effects of marital quality on weight integrating social eating (and the social

facilitation effect), emotional eating, and the notion of barriers (feeling stuck) to an area of research where marriage may not be beneficial to health. The inclusion of barriers to leaving as a link to depression and subsequent weight gain has also stretched the use of this concept. To my knowledge, barriers have not been used to predict levels of depression/weight gain but rather are traditionally used to predict relationship instability. Despite the lack of strong findings in this study, further research in this area may be warranted as others have found links between relationship quality and weight (Kouvonen et al., 2011; Whiseman & Uebelacker, 2012).

Implications

Although finding only modest support for the links between marital quality and barriers to leaving on depression and limited support for their effects on weight, this study does show that both marital quality and barriers to leaving affect health. Both affect levels of depression and depression in turn has been shown to affect weight gain (Blaine, 2008). To improve health, not only should we take into account the state of our marriage and other close relationships, we should also carefully consider the impact of accumulating barriers on health. Barriers may help increase marital stability, but under certain conditions may exacerbate risk to one's health.

Conclusion

In sum, the goal of this study was to examine the paradox that despite being linked to many health benefits, marriage has also been linked to overweight/obesity. Building upon previous research assessing marital status links to weight through selection and protection effects, the aim of this study was to examine the effect of marital quality

on weight. While hypotheses about the paths through which marital quality may affect weight change were not largely supported in this study, further work may lead to informative results through careful sample selection and more direct measures. Given the prevalence of both overweight/obesity and marriage in the United States, gaining a greater understanding of how the quality of one's marriage and barriers to leaving can impact health may be a fruitful area for education and intervention.

Figure 1. Concurrent theoretical model: Marital quality path to weight.

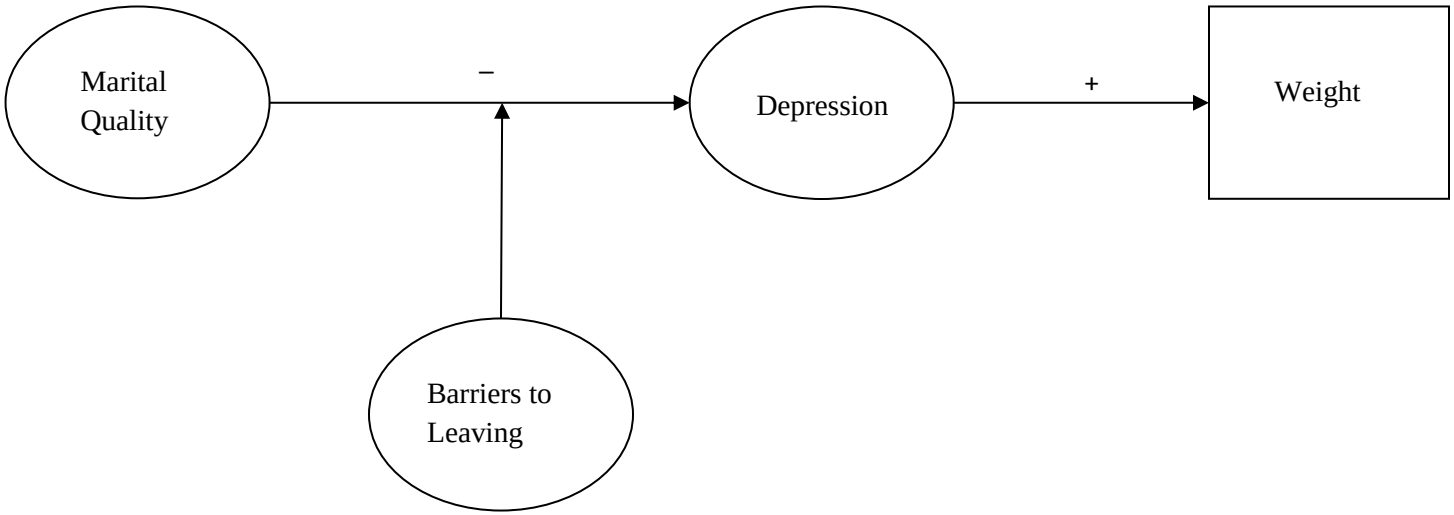
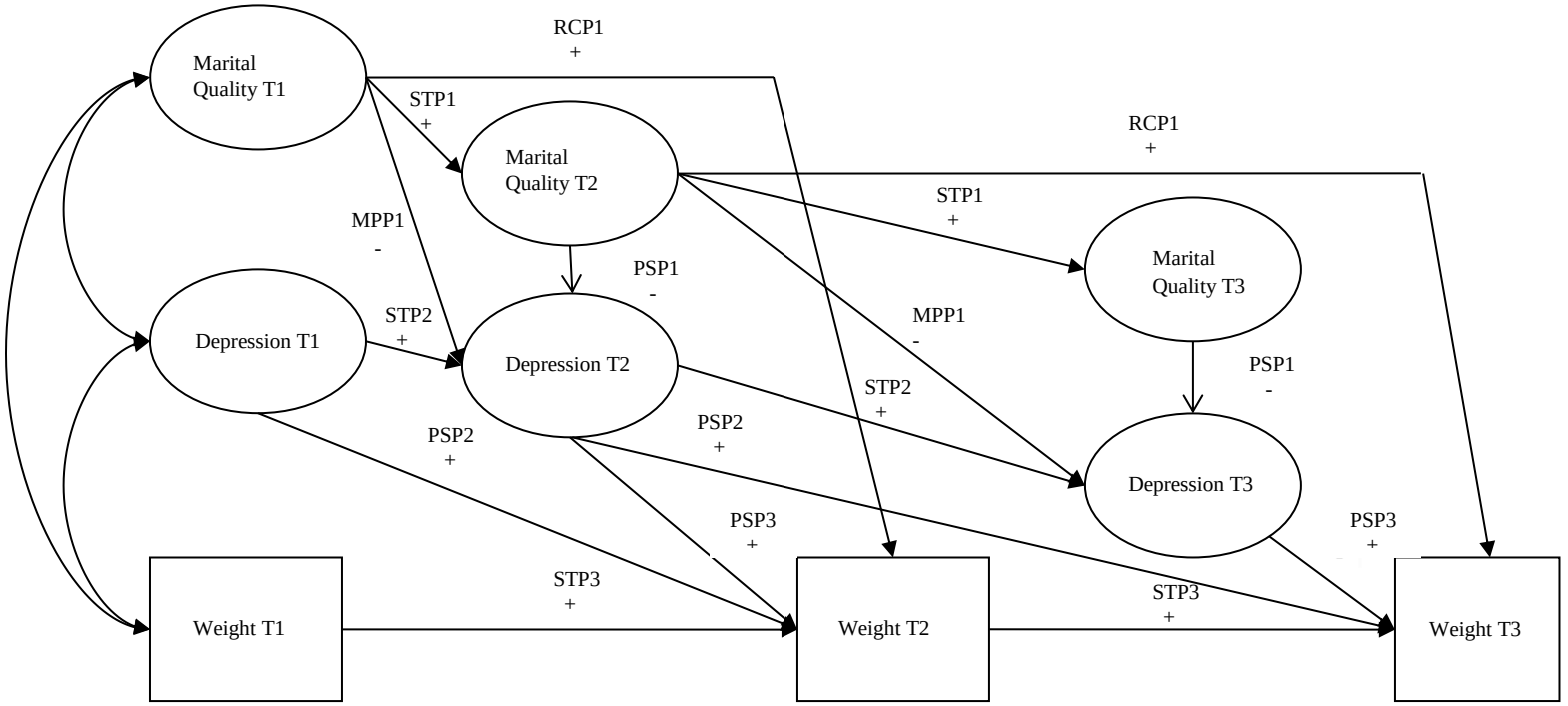
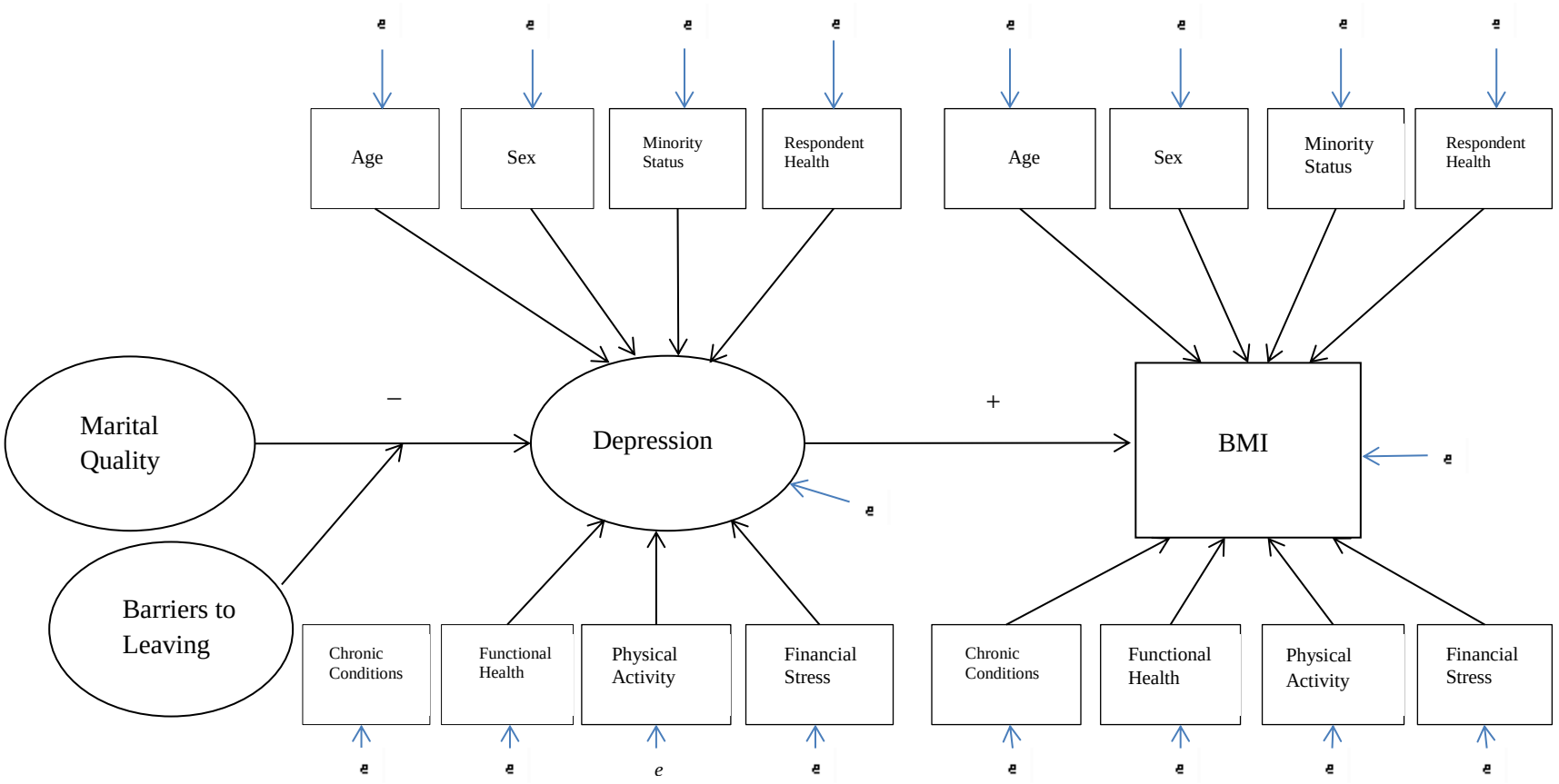


Figure 2. Longitudinal theoretical model: Marital quality paths to weight over time.



Legend	**Moderators**
Stability Path = STP Marital Protection Path = MPP Relationship Commitment Path = RCP Psychological Stress Path = PSP	MPP: Male (+) RCP: Female (-); Old (-) PSP: High Barriers (+); Old (+)

Figure 3. Structural model: Marital quality path to weight.



Appendix A

Sample Selection Variables

1. Are you currently married, separated, divorced, widowed or have you never been married?

1 = Married
2 = Separated
3 = Divorced; Marriage annulled
4 = Widowed
5 = Never married

2. Have you gotten a divorce since (month of interview, 1989 or 1986)? (Divorced since wave 1 or 2).

1 = Yes
5 = No
9 = NA

3. A flag variable for marital status corrections in wave 1 and 2 was used to see if there were any corrections made in marital status (V8999).

Appendix A-2

Sample Design and Weight Information from American's Changing Lives Codebook

Sample Design:

There were four selection stages used in this multi-stage area probability sample design. "The primary stage of sampling involves probability proportionate to size (PPS) selection of U.S. Standard Metropolitan Statistical Areas (SMSA's) and non-SMSA counties. This stage is followed by a second stage sampling of area segments within sampled primary stage sampling units (PSU's). The third stage of sample selection is preceded by a complete listing (enumeration) of all housing units (HU's) that are physically located within the bounds of the selected area segment. The third sampling stage is a systematic selection of housing units from the HU listings for the sample area segments. The fourth and final stage in the multi-stage design is the selection of the survey respondent(s) within a sample HU" (House, 2003, p.439). There was a 2 to 1 oversampling of individuals aged 60+ years and independent of this oversampling, Black individuals were also oversampled at a rate of 2 to 1 (compared to non-Black persons) in their age group. Thus the following sampling rates (relative to age and race) were used:

Non-Black, 25-59 – 1:1

Non-Black, 60+ - 2:1

Black, 25-59 – 2:1

Black, 60+ - 4:1 (House, 2003)

The overall response rate was 68% (one percent higher than assumed in sample design specifications) at Wave I. Response rates for Blacks (all age subgroups were greater than expected) (House, 2003). In Wave II, of the 3617 cases responding in Wave I, 166 were known to have died (accurate as of 5/89) and 584 were nonresponse cases (N = 2867 at Wave II) (House, 2003). In Wave III, of the 3167 cases responding in Wave I, 544 were known to be dead (accurate as of 3/29/2007) and 511 were nonresponse cases resulting in a sample size of 2562 at wave III (House, 2008).

Sample Weights:

"The weight variable which is recommended for descriptive analyses of the ACL dataset is a composite weight which has been formed as the product of five component factors: (1) the housing unit selection weight, (2) the household screening factor, (3) the respondent selection factor, (4) the nonresponse adjustment weight, and (5) the post-stratification component weights" (House, 2003, p. 457). The final total weight (V1859 (Wave I)) brings the total N to the size of the US population in the interviewed age groups. The final centered weight (V1860 (Wave I)) is V1859 divided by 39903.9282 to bring the total N to the true number of respondents in the study (N = 3617) (House, 2003). This final centered weight (V1860) is used in the analyses for this project (for Wave I).

"Weights generated for the second wave began with the nonresponse adjusted weights from wave I. These weights were adjusted for nonresponse to wave II and were then

poststratified" (House, 2003, p. 851). The final noncentered weight provides an estimate of the number of people in the eligible population. To have the weights sum to the unweighted sample, size the final weight was divided by the average weight. "The initial weights have been centered to sum to the unweighted number of respondents and nonrespondents (i.e. the following adjustment factor has been applied to the wave I nonresponse adjusted weights: 3451/18,842,959)" (House, 2003, p. 854). "Nonresponse adjustment factors have been calculated to compensate for the 584 cases with total unit nonresponse. Item nonresponse will be handled by imputation" (House, 2003, p. 853). To adjust for poststratification (wave II), "the poststratification adjusted weights were initially centered to equal 2,868 by multiplying each weight by 2,868/139,941,874. After preliminary use of the weighted data it was discovered that an ineligible case had completed an interview. This case had its weight set to 0. The remaining weights were recentered to sum to 2,867" (the sample size at wave II) (House, 2003, p. 854-855) to create V5860 – final centered weight for Wave II. This weight is used in the analyses for this project (for Wave II).

The codebook did not include descriptions of how the weight variables were adjusted for Wave III. V10818 is listed as the uncentered weight that is for analyses involving all 3-wave panel cases (N = 2348). V10819 is the centered weight. Thus for Wave III, V10819 is used as the weight variable in the analyses for this project.

As suggested by Heeringa, West, & Berglund (2010) the three weight variables were checked for missing and zero values. As indicated in Table 26 below, there were no missing or zero values. The distributions were approximately normally distributed.

Table 26. Descriptives for Wave I –III Weight Variables

	Weight Variable Wave I	Weight Variable Wave I	Weight Variable Wave III
Mean	1.93	1.85	1.71
Standard Deviation	1.003	1.009	0.931
Minimum	0.23	0.22	0.22
Maximum	10.15	9.43	8.58
N	465	465	465

Appendix B

Body Mass Index

1. How tall are you without shoes on? (inches)

2. About how much do you weigh? (pounds)

3. *Four Category BMI* (created variable)

1 = underweight
2 = normal weight
3 = overweight
4 = obese

Appendix C

Marital Quality

1. How much does your (husband/wife/partner) make you feel loved and cared for?

1 = A great deal
2 = Quite a bit
3 = Some
4 = A little
5 = Not at all

2. How much is (he/she) willing to listen when you need to talk about your worries or problems?

1 = A great deal
2 = Quite a bit
3 = Some
4 = A little
5 = Not at all

3. Taking all things together, how satisfied are you with your (marriage/relationship)?

1 = Completely satisfied
2 = Very satisfied
3 = Somewhat satisfied
4 = Not very satisfied
5 = Not at all satisfied

4. How often would you say the two of you typically have unpleasant disagreements or conflicts?

1 = Daily or almost daily
2 = 2 or 3 times a week
3 = About once a week
4 = 2 or 3 times a month
5 = About once a month
6 = Less than once a month
7 = Never

5. Taking everything into consideration, how often do you feel bothered or upset by your marriage/relationship?

1 = Almost always
2 = Often
3 = Sometimes
4 = Rarely
5 = Never

Appendix C-2

Marital Quality Item Correlations

Table 27: Correlations Among Marital Quality Items used in the Created Indices Waves I – III (after reverse coding and standardizing)

Wave I					
	1	2	3	4	5
1. Love and cared for	1.0 (*n* = 465)				
2. Willing to listen	0.56** (*n* = 465)	1.0 (*n* = 465)			
3. Satisfaction with marriage	0.62** (*n* = 464)	0.51** (*n* = 464)	1.0 (*n* = 464)		
4. Unpleasant disagreements	0.37** (*n* = 464)	0.31** (*n* = 464)	0.39** (*n* = 463)	1.0 (*n* = 464)	
5. Bothered by marriage	0.54** (*n* = 464)	0.50** (*n* = 464)	0.62** (*n* = 463)	0.44** (*n* = 463)	1.0 (*n*= 464)
Wave II					
	1	2	3	4	5
1. Love and cared for	1.0 (*n* = 465)				
2. Willing to listen	0.53** (*n* = 465)	1.0 (*n* = 465)			
3. Satisfaction with marriage	0.68** (*n* = 465)	0.52** (*n* = 465)	1.0 (*n* = 465)		
4. Unpleasant disagreements	0.36** (*n* = 465)	0.25** (*n* = 465)	0.43** (*n* = 465)	1.0 (*n* = 465)	
5. Bothered by marriage	0.53** (*n* = 463)	0.44** (*n* = 463)	0.65** (*n* = 463)	0.50** (*n* = 463)	1.0 (*n* = 463)
Wave III (*n* = 462)					
	1	2	3	4	5
1. Love and cared for	1.0				
2. Willing to listen	0.67**	1.0			
3. Satisfaction with marriage	0.67**	0.54**	1.0		
4. Unpleasant disagreements	0.30**	0.25**	0.30**	1.0	

Table 27: Correlations Among Marital Quality Items used in the Created Indices Waves I – III (after reverse coding and standardizing), continued

5. Bothered by marriage	0.59**	0.49**	0.65**	0.45**	1.0

** $p < .01$.

Appendix D

Depression

CESD - Depression index (11 – item)

1 = Hardly Ever; 2 = Some of the Time; 3 = Most of the Time

1. In the past week, I felt depressed.
2. In the past week, I felt that everything I did was an effort.
3. In the past week, my sleep was restless.
4. In the past week, I was happy.
5. In the past week, I felt lonely.
6. In the past week, people were unfriendly.
7. In the past week, I enjoyed life.
8. In the past week, I did not feel like eating. My appetite was poor.
9. In the past week, I felt sad.
10. In the past week, I felt that people disliked me.
11. In the past week, I could not get "going".

Appendix E

Barriers to Leaving

Religious participation

1. How often do you attend religious services?

1 = More than once a week
2 = Once a week
3 = 2 or 3 times a month
4 = About once a month
5 = Less than once a month
6 = Never

Religiosity

1. In general, how important are religious or spiritual beliefs in your day-to-day life?

1 = Very important
2 = Fairly important
3 = Not too important
4 = Not at all important

Number of children in the household (17 and younger)

1. I need the age, sex and relationship to you of everyone age 17 or younger who lives here.

Marital duration (proxy for investment)

1. Date of interview - year
2. In what year were you married?

Employment status (inverse barrier)

1. We would like to know about what you do. Are you working now for pay, looking for work, retired from a paid job, keeping house, a student or something else? (yes, no)
    1. Working now
    2. Only temporarily load off, sick or maternity leave
    3. Unpaid family worker

4. Looking for work, unemployed
5. Retired from paid job
6. Permanently disabled
7. Keeping house
8. Student
9. Other (specify)

Income (inverse barrier)

1. How much do you earn now from this job? (dollars and cents per time period stated (hour, day, week, bi-weekly, month, year, other (piecework/by job))

Education (inverse barrier)

1. What is the highest grade of school or year of college you have completed? (number in years)

Hours worked per year (proxy for time constraints)

1. Including paid vacation and sick leave, how many weeks altogether were you employed during the past 12 months? (number of weeks)
2. On the average, how many hours a week do you work on this job, including paid and unpaid overtime? (number of hours)

Assets (inverse barrier)

1. If you sold this (house/apartment/farm) today, how much money would you get for it (after paying off the mortgage)? (coded in dollars)
2. Suppose you needed money quickly, and you cashed in all of your (and your spouse's) checking and savings accounts, and any stocks and bonds, and real estate (other than your principal home). If you added up what you got, about how much would this amount to? Just give me the letter from the list.
   1 = Less than $10, 000
   2 = $10,000 - $19,999
   3 = $20,000 - $49,999
   4 = $50,000 - $99,999
   5 = $100,000 - $199,999
   6 = $200,000 - $499,999
   7 = $500,000 or more

Appendix E-2

Regression Coefficients for Barriers on Depression and BMI

Table 28: Standardized Regression Coefficients for the Effects of Measures of Barriers on Depression and BMI (using weighted data)

Depression			
	Wave I	Wave II	Wave III
	Beta	Beta	Beta
Religious participation	-.25**	-.14*	-.14*
Religiosity	.18*	.07	.15*
Number of children in household	.00	.03	.01
Marital duration	.02	.02	-.04
Employment status	-.07	-.10[t]	-.11*
Income	.10[t]	.15*	.14*
Education	.05	.13*	.14*
Hours worked/year	-.01	-.02	.02
Assets	-.02	.07	.01
N	292	442	373
BMI			
	Wave I	Wave II	Wave III
	Beta	Beta	Beta
Religious participation	.01	-.01	.04
Religiosity	.02	.04	.06
Number of children in household	.10[t]	.02	-.01
Marital duration	.08	.12*	.11[t]
Employment status	.17*	.08	.00
Income	-.05	-.03	-.06

Table 28: Standardized Regression Coefficients for the Effects of Measures of Barriers on Depression and BMI (using weighted data), continued

Education	.07	.13*	.10t
Hours worked/year	-.28**	-.24**	-.14*
Assets	.07	.07	.13*
N	292	442	373

[t] $p < .15$; * $p < .05$; ** $p < .01$.

Appendix F

Demographic and Control Variables

Age of respondent (used as a moderator)

1. I need to list the people who live here – adults first, then people under 18. I don't need names, just the age sex and relationship to you for each person. Let's start with you. How old are you? Now, I need the age, sex and relationship to you of the other people 18 or older who live here.

Sex (used as a moderator)

Ethnicity

1. Are you of Spanish or Hispanic descent, that is, Mexican, Mexican American, Chicano, Puerto Rican, Cuban or Spanish? Which one?
2. Are you white, black, American Indian, Asian, or another race?
3. In addition to being American, what do you think of as your ethnic background or origins?
4. In what state or foreign country were you born?
5. In what state or foreign country was your natural father born?
6. In what state of foreign country was your natural mother born?

Based on the above 6 questions, ACL staff created a 5 category race/ethnicity variable:

1. White
2. Black
3. Native American
4. Asian
5. Hispanic

Respondent's health

1. How would you rate your health at the present time?

1 = Excellent
2 = Very good
3 = Good
4 = Fair
5 = Poor

2. In general, how satisfied are you with your health?

1 = Completely satisfied
2 = Very satisfied
3 = Somewhat satisfied

4 = Not very satisfied
5 = Not at all satisfied

3. How much are your daily activities limited in any way by your health or health related problems?

1 = A great deal
2 = Quite a bit
3 = Some
4 = A little
5 = Not at all

Chronic conditions

1. Have you had arthritis or rheumatism during the last 12 months? (yes, no)
2. During the last 12 months, have you had a lung disease?
3. Have you had hypertension, sometimes called high blood pressure, or have you taken medication for it (in the last 12 months)?
4. Have you had a heart attack or other heart trouble during the last 12 months?
5. Have you had diabetes or high blood sugar, or have you taken medication for it (in the last 12 months)?
6. During the last 12 months, have you had cancer or a malignant tumor of any kind?
7. Have you had foot problems such as problems with circulation, corns or calluses (in the last 12 months)?
8. Have you had a stroke during the last 12 months?
9. Have you had any broken or fractured bones (in the last 12 months?)
10. Have you lost any amount of urine beyond your control during the last 12 months?

Functional health index

1. Are you currently in bed or a chair for most of all of the day because of your health? (yes, no)
2. Do you currently have any difficulty bathing by yourself? (yes, no)
3. How much difficulty do you have bathing by yourself?

1 = A little
2 = Some
3 = A lot
4 = Can't do this on your own

4. Does someone else help you bathe? (yes, no)
5. Do you currently have any difficulty climbing a few flights of stairs because of your health? (yes, age is only limitation, no)
6. How much difficulty do you have?

1 = A little
2 = Some
3 = A lot

4 = Can't do this at all

7. Do you currently have any difficulty walking several blocks because of your health? (yes, age is only limitation, no)

How much difficulty do you have?
1 = A little
2 = Some
3 = A lot
4 = Can't do this at all

8. Would you currently have any difficulty doing heavy work around the house such as shoveling snow or washing walls, because of your health? (yes, age is only limitation, no)

How much difficulty would you have?
1 = A little
2 = Some
3 = A lot
4 = Can't do this at all

Based on these questions the following Functional Health Index was created (by ACL staff):
1 = Most severe functional impairment
2 = Moderately severe functional impairment
3 = Least severe functional impairment
4 = No functional impairment

Physical activity index

1 = Often; 2 = Sometimes; 3 = Rarely; 4 = Never

1. How often do you work in the garden or yard?
2. How often do you engage in active sports or exercise?
3. How often do you take walks?

Financial chronic stress index

1. How satisfied are you with your/your family's present financial situation?

1 = Completely
2 = Very
3 = Somewhat
4 = Not very
5 = Not at all

2. How difficult is it for you/your family to meet the monthly payments on your family's bills?

1 = Extremely difficult
2 = Very difficult
3 = Somewhat difficult
4 = Slightly difficult
5 = Not difficult at all

3. In general, how do your family's finances usually work out at the end of the month?

1 = Some money left over
2 = Just enough money to make ends meet
3 = Not enough money to make ends meet

Appendix F-2

Regression Coefficients for Control Variables on Depression and BMI

Table 29: Standardized Regression Coefficients for the Effects of Control Variables on Depression and BMI (using weighted data)

Depression			
	Wave I	Wave II	Wave III
	Beta	Beta	Beta
Age	-.03	-.04	.00
Gender	.10*	.04	.10*
Minority Status	.20**	.13*	.12*
Respondent's Health	.25**	.22**	.27**
Chronic Conditions	.07t	.06	.02
Functional Health	.05	-.06	-.13*
Physical Activity	-.11*	-.14*	-.07t
Financial Chronic Stress	.11*	.17**	.21**
N	465	465	462
BMI			
	Wave I	Wave II	Wave III
	Beta	Beta	Beta
Age	.15**	.11*	.13*
Gender	-.27**	-.25**	-.18**
Minority Status	.02	.03	-.01
Respondent's Health	.14*	.25**	.18**
Chronic Conditions	.15*	.10*	.08t
Functional Health	.04	.09t	.02
Physical Activity	-.05	-.08t	-.08t

Table 29: Standardized Regression Coefficients for the Effects of Control Variables on Depression and BMI (using weighted data), continued

Financial Chronic Stress	.08t	.04	.12*
N	465	465	462

[t] $p < .15$; * $p < .05$; ** $p < .01$.

Appendix G

Cross-sectional Suppressor Models

Tables 30 (without controls) and 31 (with controls) below show model results for the test the suppressor hypothesis (XSECT2).

Table 30. Model results for Waves I-III testing the suppressor hypothesis without control variables

Unstandardized Parameter Estimates						
	Wave I (*n*=465)		Wave II (*n*=465)		Wave III (*n*=462)	
	Estimate	SE	Estimate	SE	Estimate	SE
On Depression (DEP)						
Marital quality (MQ)	**-2.44*** **	0.38	**-3.08*** **	0.48	**-2.48*** **	0.34
Barriers (BARS)	**0.79***	0.39	**0.99****	0.37	**1.45*** **	0.33
BARS*MQ	-2.00	3.08	-3.61	3.85	**-12.09*** **	2.91
On Body Mass Index (BMI)						
Marital quality	0.25	0.30	-1.68	2.05	0.37	0.40
Depression	0.76	1.94	0.06	0.30	-1.63	1.98
Intercepts						
BMI	24.75**	1.54	27.58**	1.65	28.32**	1.60
DEP	1.50**	0.40	1.77**	0.39	0.84*	0.29
Residuals						
BMI	21.72**	2.65	23.50**	2.95	27.09**	3.36
DEP	0.77**	0.07	0.67**	0.06	0.54**	0.06
Tests of Model Fit						
Chi Square						
Value	1.41		0.61		2.70	
df	2		2		2	
p value	0.49		0.74		0.26	
CFI	1.00		1.00		0.99	
TLI	1.05		1.07		0.97	
RMSEA	0.00		0.00		0.03	
SRMR	0.01		0.01		0.02	

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 31. Model results for Waves I-III testing the suppressor hypothesis with the addition of control variables

Unstandardized Parameter Estimates						
	Wave I (*n*=465)		Wave II (*n*=465)		Wave III (*n*=462)	
	Estimate	SE	Estimate	SE	Estimate	SE
On Depression (DEP)						
Marital quality (MQ)	**-2.00*** **	0.38	**-2.46*** **	0.48	**-1.93*** **	0.32
Barriers (BARS)	-0.02	0.43	0.41	0.39	**0.81***	0.34
BARS*MQ	-0.18	3.04	-1.82	3.40	**-10.32*** **	2.73
Age	-0.01	0.01	-0.01	0.01	-0.00	0.01
Sex	0.13	0.10	-0.00	0.10	0.04	0.07
Minority	**0.48*** **	0.14	**0.26***	0.13	**0.28** **	0.11
Respondent health	**0.11*** **	0.03	**0.07***	0.03	**0.09*** **	0.02
Chronic conditions	0.13	0.08	0.11	0.08	0.02	0.05
Functional health	0.08	0.12	-0.28	0.28	-0.15	0.08
Physical activity	-0.11	0.06	**-0.13***	0.05	-0.05	0.04
Financial stress	0.07	0.05	0.10	0.06	0.09	0.05
On Body Mass Index (BMI)						
Marital quality	0.39	1.91	-0.29	2.05	-1.42	1.86
Depression	-0.06	0.31	-0.47	0.31	-0.27	0.45
Age	**0.13** **	0.04	**0.10***	0.04	**0.11***	0.05
Sex	**-2.47*** **	0.43	**-2.40*** **	0.46	**-2.02*** **	0.50
Minority	0.26	0.53	0.50	0.57	-0.05	0.60
Respondent health	**0.34***	0.15	**0.72*** **	0.15	**0.42** **	0.15
Chronic conditions	**1.19***	0.47	**0.81***	0.41	0.54	0.37
Functional health	0.52	0.81	1.77	0.99	0.09	0.60

Table 31. Model results for Waves I-III testing the suppressor hypothesis with the addition of control variables, continued

Physical activity	-0.28	0.25	-0.55	0.28	-0.52	0.31
Financial stress	0.48	0.28	0.33	0.41	**0.71***	0.36
Intercepts						
BMI	19.89**	4.05	14.39*	5.11	23.33**	4.00
DEP	0.06	0.83	2.13	1.28	0.42	0.56
Residuals						
BMI	18.42**	2.37	19.42**	2.54	23.63**	3.03
DEP	0.66**	0.06	0.59**	0.05	0.46**	0.04
Tests of Model Fit						
Chi Square						
Value	6.67		3.36		7.08	
df	2		2		2	
p value	0.04		0.19		0.03	
CFI	0.97		0.99		0.97	
TLI	0.62		0.89		0.67	
RMSEA	0.07		0.04		0.07	
SRMR	0.01		0.01		0.01	

* $p < .05$; ** $p < .01$; *** $p < .001$

Tables 32 (without controls) and 33 (with controls) below show model results for the test the suppressor hypothesis by age.

Table 32. Model results for Waves I-III testing the suppressor hypothesis by age without control variables

Unstandardized Parameter Estimates						
	Wave I		Wave II		Wave III	
	Estimate	SE	Estimate	SE	Estimate	SE
Young						
On Depression (DEP)						
Marital quality (MQ)	**-2.66*** **	0.60	**-3.22*** **	0.67	**-2.70*** **	0.42
Barriers (BARS)	0.49	0.61	0.68	0.53	**1.29** **	0.43
BARS*MQ	-1.99	4.81	-7.05	5.53	**-16.46*** **	4.47
On Body Mass Index (BMI)						
Marital quality	1.36	3.34	-2.51	3.14	-0.77	2.93
Depression	0.74	0.51	0.54	0.47	1.12	0.63
Intercepts						
BMI	23.68**	2.59	27.96**	2.51	27.61**	2.31
DEP	1.84*	0.64	2.03**	0.54	1.05*	0.35
Residuals						
BMI	20.60**	3.96	25.09**	5.17	27.70**	5.27
DEP	0.74**	0.10	0.66**	0.09	0.42**	0.06
N		241		241		240
Old						
On Depression (DEP)						
Marital quality (MQ)	**-2.25*** **	0.44	**-2.89*** **	0.48	**-2.20*** **	0.53
Barriers (BARS)	**1.11** *	0.52	**1.39** **	0.49	**1.57** **	0.50
BARS*MQ	-1.94	3.73	1.07	4.08	**-9.44** *	3.89
On Body Mass Index (BMI)						
Marital quality	0.03	2.20	-0.72	2.43	-1.64	2.60
Depression	-0.22	0.34	-0.48	0.33	-0.26	0.43

Table 32. Model results for Waves I-III testing the suppressor hypothesis by age without control variables, continued

Intercepts						
BMI	25.96**	1.84	27.10**	1.95	28.50**	2.11
DEP	1.16*	0.47	1.40*	0.47	0.60	0.46
Residuals						
BMI	21.67**	3.15	20.85**	2.72	25.47**	3.93
DEP	0.80**	0.09	0.66**	0.09	0.66**	0.10
N	224		224		222	
Tests of Model Fit						
Chi Square						
Value	3.37		2.63		4.31	
df	4		4		4	
p value	0.50		0.62		0.37	
CFI	1.00		1.00		1.00	
TLI	1.05		1.06		0.99	
RMSEA	0.00		0.00		0.02	
SRMR	0.02		0.02		0.03	

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 33. Model results for Waves I-III testing the suppressor hypothesis by age with the addition of control variables

Unstandardized Parameter Estimates						
	Wave I		Wave II		Wave III	
	Estimate	SE	Estimate	SE	Estimate	SE
Young						
On Depression (DEP)						
Marital quality (MQ)	**-2.14*** **	0.62	**-2.21*** **	0.60	**-2.19*** **	0.40
Barriers (BARS)	-0.26	0.63	0.29	0.52	**1.07***	0.44
BARS*MQ	1.60	5.00	-3.72	4.33	**-15.58*** **	4.52
Sex	0.16	0.13	0.06	0.14	-0.00	0.10
Minority	**0.51****	0.19	0.20	0.20	0.23	0.16
Respondent health	0.08	0.04	**0.17*** **	0.04	0.05	0.03
Chronic conditions	0.21	0.12	-0.06	0.10	0.03	0.06
Functional health	-0.11	0.18	0.37	0.25	-0.01	0.11
Physical activity	-0.05	0.10	-0.14	0.08	-0.02	0.05
Financial stress	0.06	0.07	0.08	0.08	0.12	0.07
On Body Mass Index (BMI)						
Marital quality	1.72	3.03	0.93	3.01	0.47	0.63
Depression	0.44	0.50	-0.24	0.45	-0.08	2.68
Sex	**-2.76*** **	0.57	**-2.52*** **	0.68	**-2.67*** **	0.69
Minority	0.59	0.85	0.96	0.84	0.69	0.80
Respondent health	0.28	0.18	**0.86*** **	0.20	**0.53****	0.18
Chronic conditions	1.24	0.87	0.44	0.63	0.37	0.53
Functional health	-0.61	1.04	0.05	1.81	-1.88	1.01
Physical activity	0.17	0.34	-0.60	0.42	**-0.71***	0.35

Table 33. Model results for Waves I-III testing the suppressor hypothesis by age with the addition of control variables, continued

Financial stress	0.61	0.41	0.82	0.65	0.69	0.45
Intercepts						
BMI	27.46**	4.71	22.56*	8.90	34.19**	5.49
DEP	0.93	1.17	-1.29	1.22	0.26	0.62
Residuals						
BMI	17.41**	3.62	20.52**	4.21	22.90**	4.81
DEP	0.63**	0.09	0.56**	0.07	0.39**	0.06
N		241		241		240
Old						
On Depression (DEP)						
Marital quality (MQ)	**-1.88*** **	0.43	**-2.57*** **	0.49	**-1.60*** **	0.43
Barriers (BARS)	0.28	0.59	0.77	0.53	0.47	0.49
BARS*MQ	-1.61	3.47	2.52	3.77	**-7.65***	3.23
Sex	0.13	0.15	-0.12	0.12	0.10	0.11
Minority	**0.45***	0.18	0.19	0.14	**0.33***	0.14
Respondent health	**0.14*** **	0.03	-0.01	0.04	**0.12*** **	0.03
Chronic conditions	0.04	0.11	**0.28***	0.11	0.02	0.07
Functional health	0.23	0.12	**-0.58***	0.25	-0.18	0.10
Physical activity	**-0.15***	0.07	-0.06	0.06	-0.08	0.06
Financial stress	0.07	0.08	**0.17***	0.07	0.06	0.08
On Body Mass Index (BMI)						
Marital quality	-0.69	2.40	0.04	2.51	-0.82	0.51
Depression	-0.66	0.35	**-0.77***	0.34	-1.41	2.50
Sex	**-2.06** **	0.66	**-2.21*** **	0.63	**-1.37***	0.68
Minority	0.24	0.62	-0.00	0.72	-0.70	0.82

Table 33. Model results for Waves I-III testing the suppressor hypothesis by age with the addition of control variables, continued

Respondent health	**0.46***	0.23	**0.56****	0.22	0.37	0.22
Chronic conditions	0.98	0.51	**1.18***	0.49	0.83	0.46
Functional health	1.39	1.13	**2.46***	1.04	0.76	0.57
Physical activity	-0.70	0.36	-0.63	0.40	-0.42	0.50
Financial stress	0.43	0.38	-0.02	0.42	0.72	0.52
Intercepts						
BMI	21.17**	5.68	16.37*	5.28	25.45**	3.52
DEP	-1.03	0.78	3.64*	1.18	0.06	0.64
Residuals						
BMI	18.89**	2.42	17.58**	2.21	22.65**	3.35
DEP	0.68**	0.07	0.55**	0.07	0.50**	0.06
N	224		224		222	
Tests of Model Fit						
Chi Square						
Value	10.56		8.64		7.38	
df	4		4		4	
p value	0.03		0.07		0.12	
CFI	0.95		0.98		0.98	
TLI	0.48		0.74		0.82	
RMSEA	0.08		0.07		0.06	
SRMR	0.02		0.01		0.01	

* $p < .05$; ** $p < .01$; *** $p < .001$

Tables 34 (without controls) and 35 (with controls) below show model results for the test the suppressor hypothesis by sex.

Table 34. Model results for Waves I-III testing the suppressor hypothesis by sex without control variables

Unstandardized Parameter Estimates						
	Wave I		Wave II		Wave III	
	Estimate	SE	Estimate	SE	Estimate	SE
Male						
On Depression (DEP)						
Marital quality (MQ)	**-2.13****	0.76	**-2.21*****	0.64	**-1.66*****	0.46
Barriers (BARS)	0.85	0.70	1.23	0.65	**2.00*****	0.56
BARS*MQ	-0.69	6.83	1.01	5.61	**-8.84***	4.04
On Body Mass Index (BMI)						
Marital quality	-2.84	2.63	-2.68	2.87	-4.53	3.34
Depression	0.23	0.49	-0.50	0.38	0.04	0.42
Intercepts						
BMI	28.86**	2.17	29.21**	2.40	31.47**	2.83
DEP	1.15	0.67	0.94	0.55	-0.07	0.41
Residuals						
BMI	18.98**	3.60	21.88**	4.60	26.41**	5.19
DEP	0.60**	0.07	0.59**	0.09	0.44**	0.07
N		218		218		215
Female						
On Depression (DEP)						
Marital quality (MQ)	**-2.52*****	0.54	**-3.57*****	0.65	**-2.99*****	0.47
Barriers (BARS)	0.38	0.61	0.73	0.54	0.92	0.48
BARS*MQ	-1.92	4.32	-2.91	4.99	**-11.75****	4.37
On Body Mass Index (BMI)						
Marital quality	2.32	2.68	-0.82	2.79	0.84	0.61
Depression	0.51	0.35	0.70	0.42	0.03	2.48

Table 34. Model results for Waves I-III testing the suppressor hypothesis by sex without control variables, continued

Intercepts						
BMI	22.36**	2.04	25.91**	2.13	26.16**	1.83
DEP	1.84*	0.63	2.30**	0.59	1.51**	0.43
Residuals						
BMI	21.68**	3.56	22.54**	2.57	25.40**	3.11
DEP	0.94**	0.11	0.74**	0.08	0.63**	0.09
N	247		247		247	
Tests of Model Fit						
Chi Square						
Value	12.47		7.29		8.91	
df	4		4		4	
p value	0.01		0.12		0.06	
CFI	0.80		0.96		0.95	
TLI	0.29		0.86		0.82	
RMSEA	0.10		0.06		0.07	
SRMR	0.04		0.03		0.04	

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 35. Model results for Waves I-III testing the suppressor hypothesis by sex with the addition of control variables

Unstandardized Parameter Estimates						
	Wave I		Wave II[8]		Wave III	
	Estimate	SE	Estimate	SE	Estimate	SE
Male						
On Depression (DEP)						
Marital quality (MQ)	**-2.25****	0.73	**-1.31***	0.65	**-1.68*****	0.44
Barriers (BARS)	-0.16	0.62	0.35	0.64	**1.45****	0.46
BARS*MQ	-1.04	6.77	3.85	5.10	**-8.00****	2.96
Age	-0.00	0.01	-0.01	0.01	-0.01	0.01
Minority	**0.58*****	0.16	0.17	0.18	0.32	0.17
Respondent health	**0.08***	0.04	0.07	0.04	0.04	0.03
Chronic conditions	0.19	0.12	0.04	0.16	0.11	0.07
Functional health	-0.06	0.17	_____	_____	-0.18	0.12
Physical activity	-0.01	0.07	**-0.14***	0.07	0.01	0.05
Financial stress	0.09	0.08	**0.18***	0.08	-0.03	0.07
On Body Mass Index (BMI)						
Marital quality	-4.67	3.09	-0.12	2.71	-3.92	3.05
Depression	-0.20	0.62	**-0.96***	0.42	-0.32	0.47
Age	**0.13***	0.06	0.11	0.07	0.11	0.08
Minority	0.10	0.93	-0.24	0.77	-0.72	0.81
Respondent health	0.32	0.22	**0.62****	0.24	**0.46***	0.22
Chronic conditions	**1.68***	0.69	-0.05	0.56	-0.06	0.53

[8] Analysis was run without control variable functional health for Wave II due to variable non-normality causing model non-identification (there were only two males with moderate functional impairment; the remaining males had no impairment).

Table 35. Model results for Waves I-III testing the suppressor hypothesis by sex with the addition of control variables, continued

Functional health	1.33	0.82	_____	_____	-0.05	0.97
Physical activity	-0.18	0.35	-0.76	0.43	-0.40	0.47
Financial stress	0.35	0.46	0.77	0.70	0.33	0.58
Intercepts						
BMI	18.36**	5.06	19.82**	4.44	24.60**	6.18
DEP	0.94	1.16	0.34	0.65	0.46	0.82
Residuals						
BMI	16.89**	3.30	19.92**	4.07	24.73**	4.96
DEP	0.51**	0.06	0.54**	0.08	0.38**	0.06
N		218		218		215
Female						
On Depression (DEP)						
Marital quality (MQ)	**-1.89*** **	0.51	**-3.00*** **	0.65	**-1.83*** **	0.45
Barriers (BARS)	0.11	0.56	0.42	0.46	0.38	0.43
BARS*MQ	0.03	3.91	0.02	3.95	**-11.22** **	3.93
Age	-0.00	0.01	-0.01	0.01	0.01	0.01
Minority	0.37	0.21	0.27	0.18	0.16	0.13
Respondent health	**0.14*** **	0.04	**0.10** **	0.04	**0.15*** **	0.03
Chronic conditions	0.09	0.11	0.17	0.10	-0.09	0.07
Functional health	0.21	0.18	_____	_____	-0.12	0.11
Physical activity	**-0.20***	0.10	-0.13	0.07	-0.07	0.06
Financial stress	0.04	0.07	0.04	0.08	**0.25*** **	0.07

Table 35. Model results for Waves I-III testing the suppressor hypothesis by sex with the addition of control variables, continued

On Body Mass Index (BMI)						
Marital quality	4.58	2.61	0.07	2.86	1.44	2.56
Depression	0.02	0.31	-0.23	0.41	-0.17	0.69
Age	**0.14***	0.06	0.08	0.05	0.09	0.06
Minority	0.47	0.69	1.29	0.76	0.99	0.80
Respondent health	**0.39***	0.18	**0.76*****	0.17	0.36	0.20
Chronic conditions	0.93	0.68	**1.18***	0.48	**1.23****	0.44
Functional health	-0.93	1.51	_____	_____	-0.04	0.77
Physical activity	-0.39	0.35	-0.35	0.40	-0.64	0.44
Financial stress	0.51	0.33	0.03	0.42	**1.21*****	0.37
Intercepts						
BMI	16.35*	6.68	15.81**	2.84	17.17**	4.60
DEP	-0.44	1.06	1.37	0.72	0.06	0.75
Residuals						
BMI	19.01**	3.08	18.23**	2.08	21.28**	3.02
DEP	0.79**	0.10	0.63**	0.07	0.47**	0.05
N	247		247		247	
Tests of Model Fit						
Chi Square						
Value	3.70		3.62		11.06	
df	4		4		4	
p value	0.45		0.46		0.03	
CFI	1.00		1.00		0.96	
TLI	1.03		1.02		0.60	
RMSEA	0.00		0.00		0.09	
SRMR	0.01		0.01		0.02	

* $p < .05$; ** $p < .01$; *** $p < .001$

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